

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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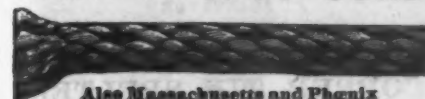
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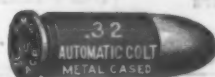
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THE IRON AGE

THURSDAY, DECEMBER 31, 1903.

The Ball Crank Pin Grinder.

The Ball grinder is a machine designed for finishing crank pins on the shafts of gasoline engines and similar motors for automobiles and other classes of service. The front view of the machine is presented in Fig. 1. Fig. 3 shows the rear, giving a good idea of the method of mounting the grinding wheel. A cross sectional elevation is given in Fig. 2, showing particularly the mechanism for longitudinal traverse of the grinding wheel, as will be described later.

In both Figs. 1 and 3 is plainly seen what is perhaps the principal feature of the machine—namely, the double

of an adjusting device on the upper gear at the tailstock end. This device is on the left hand side of this gear, as seen in Fig. 1, and consists of a locking bolt and slot, by means of which the whole train of gearing may be adjusted and secured in proper relative position.

The work is held in the machine by means of draw-back spring collets in the faces of the cylinders rotating within the headstock and tailstock. Clamping of the work in the collets is affected by use of a spanner wrench on the draw nuts, one of which is plainly shown at the rear side of the tailstock in Fig. 3. These collets are placed at such radial distances from the center line of the rotating spindles and cylinders as to accommodate the throw of

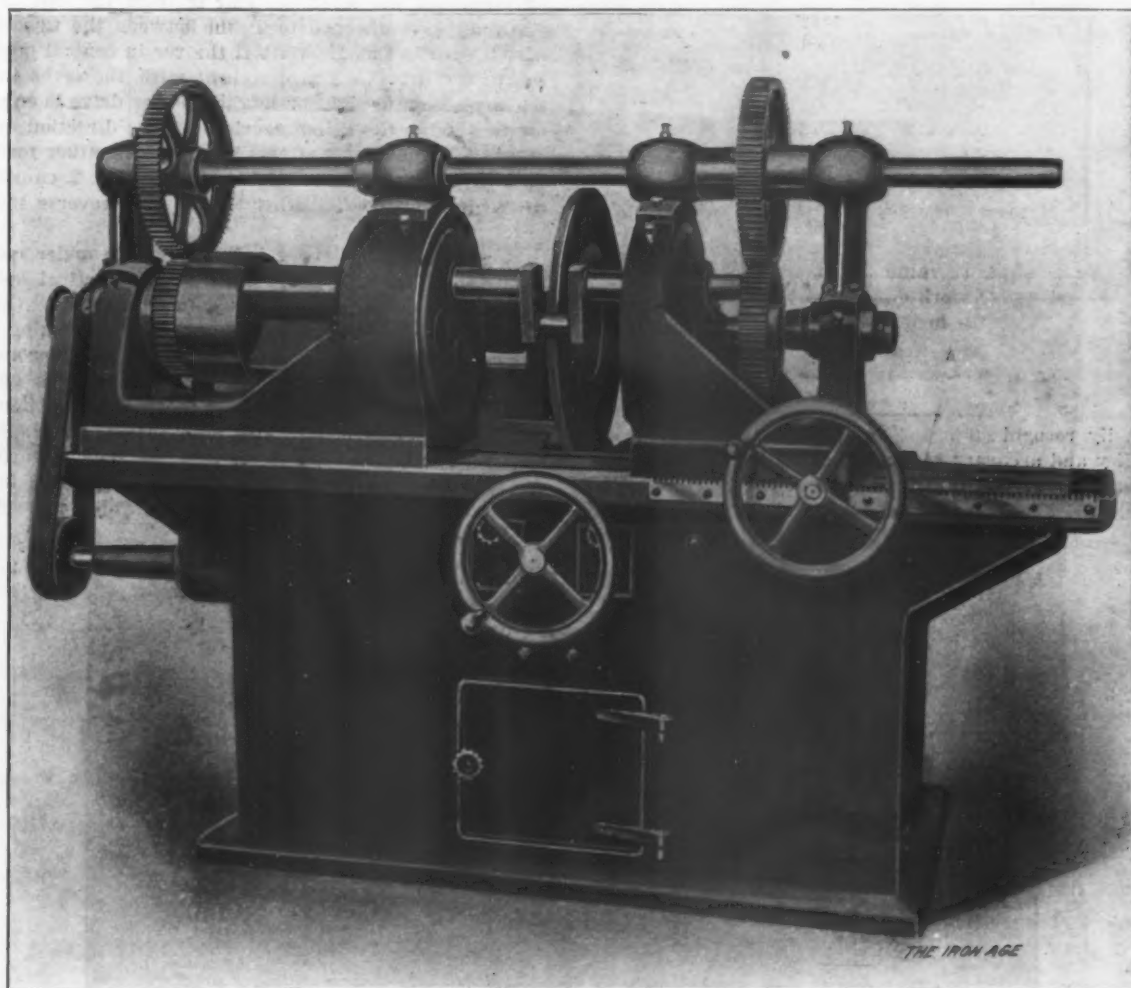


Fig. 1.—Front View, Showing Work in Place.

THE BALL CRANK PIN GRINDER.

drive of both headstock and tailstock by positive geared connection. This construction has been adopted with a view to obviating the difficulties of a single drive, by doing away with the driving of the tailstock mechanism by transmission of power through the work itself. In a machine of this nature, where the tailstock must necessarily involve moving parts of appreciable weight and offering more or less resistance to rotation, torsion and unequal grinding are unavoidable where single driving is used. The illustrations plainly show the arrangements for double driving, equal gears being mounted upon the spindles of headstock and tailstock, each gear meshing with one of another pair of equal gears upon the connecting shaft extending the full length of the machine. Synchronous working of the gearing is secured by means

the crank whose pin is to be ground. By arranging several sets of collets in the faces of the cylinders, up to the limit of space available, a corresponding number of crank throws may be accommodated without change of the machine. In the case here illustrated there are four collets in each cylinder, which might provide for four different crank radii. Two sets of these collets, however, are for 3-inch throw and the machine as fitted is designed for cranks of $2\frac{1}{4}$, 3 and 4 inch throws.

As shown in Fig. 1, the headstock cylinder is of ribbed form back of the collet face, thus allowing a considerable length of crank shaft to extend backward to the left through the cylinder. Similarly, at the tailstock end the crank may protrude to the right, as seen in Fig. 1, as far as the gear of the double drive. These

provisions for protrusion of the crank shaft make it possible for the tailstock on most work to be brought so closely to the headstock as to allow slight chance for flexure of the crank or shaft between them. This feature

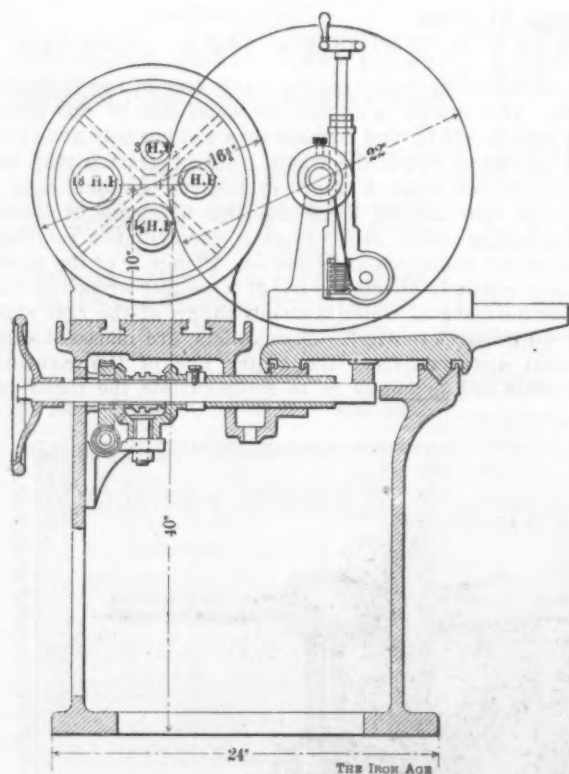


Fig. 2.—Transverse Sectional Elevation.

is easily recognized as of value in contributing to the rapidity and accuracy of work done by the machine.

At the rear end of the headstock, but in front of the double drive gearing, is the main driving pulley, which

work. Driving of the grinding wheel, also as shown in Fig. 3, is by means of a belt from a drum constituting a second overhead countershaft. The work driving countershaft and the drum countershaft are driven by any suitable means at speeds whose ratio is about 1 to 10; that is, the arrangements should be such that for 100 revolutions per minute of the work in the machine the grinding wheel turns 1000 revolutions per minute.

The grinding wheel is supported upon a cross slide carried by a suitable carriage traveling upon independent ways parallel to those upon which the tailstock is mounted. Longitudinal traverse of the grinding wheel is effected either by hand or power. Hand traverse is under control of the handwheel in front of the middle of the bed, as shown in Fig. 1. Connection of the handwheel with the grinding wheel carriage by means of a shaft and rack and pinion gearing is evident from Fig. 2. Power driving of this mechanism is derived by worm and bevel gearing, also shown in Fig. 2, the worm shaft being driven by belt connection from the main spindle of the machine, as shown at the left of Fig. 1 and at the right of Fig. 3. This power traversing gear is controlled by means of the lever protruding from the bed of the machine below the tailstock and between the two handwheels seen in Fig. 1. With this lever in central position the power drive is disconnected; with the lever in extreme position to right or left the power drive is engaged for traversing the grinding wheel in one direction or the other. The movement of this lever throws either forward or back a positive jaw clutch, shown in Fig. 2, causing it to engage one or the other of the two reverse motion bevel gears.

Cross feeding of the grinding wheel is under control of a small handwheel attached to the vertical spindle seen in Fig. 3, extending upward from the slide. On the lower end of this spindle is a worm, Fig. 2, meshing with a worm wheel upon a short shaft extending crosswise of the slide and carrying a pinion whose teeth engage those of a rack attached to the recessed space between the ways upon which the cross slide travels. The spindle, while here shown vertical, may be inclined toward the front of the machine by loosening the lock nut in the circular slot at the lower end. By inclining the spindle

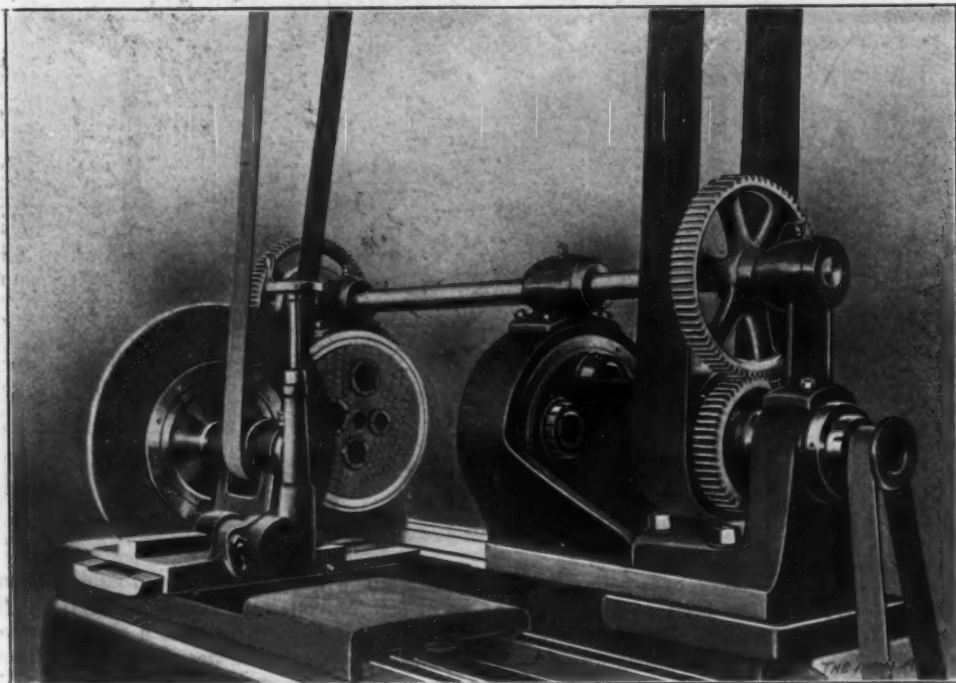


Fig. 3.—Rear View, Showing Grinding Wheel Mounting.

BALL CRANK PIN GRINDER.

is of broad face, so as to enable the use of a wide belt, with its attendant advantages. As shown in Fig. 3, power is delivered to this pulley directly from a countershaft, thus providing for quite positive rotation of the

the handwheel at its top may be brought within easier reach of the operator of the machine.

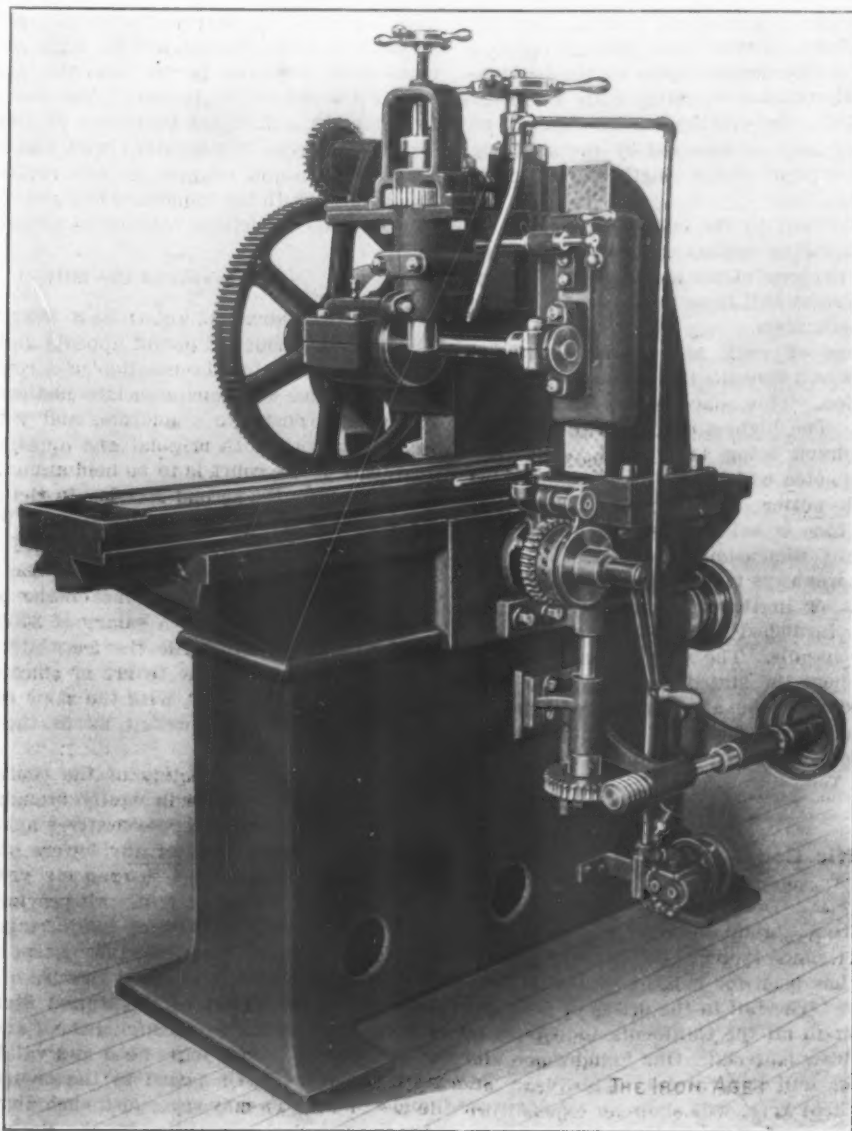
The range of movement of the tailstock upon the bed of the machine is such as to give a maximum opening of

40 inches between the collets. The tailstock is, of course, moved by means of the handwheel shown in Fig. 1 and a pinion meshing with the rack fastened by screws to the front of the ways. The grinding wheel used is 22 inches in diameter and $\frac{1}{4}$ inch thick on the face. The machine illustrated is one of a line built by the Ball Mfg. Company, Stamford, Conn.

Key Seat Milling and Routing Machine.

In adding to a horizontal milling machine for keyway cutting a vertical attachment for routing out the ends of key seats to suit feathers and drop keys the makers of the machine here shown may be considered as having

the engraving. The vertical attachment is secured to the cross rail in such a manner as to be quite independent of the horizontal spindle and not interfering in any way with its operation. Either spindle may be brought into use independently of the other. The power for driving the machine is delivered by a two-speed friction countershaft to a $14 \times 4\frac{1}{2}$ inch pulley. The driving mechanism is on the left hand side of the machine and is entirely hidden from view in the engraving. The large gear carried by the outer end of the horizontal cutter spindle receives the power from the connecting gearing, driving the spindle directly and also rotating the smaller upper gear from which the vertical routing spindle is rotated through bevel and spur gear trains, as shown. This



BURR KEY SEAT MILLING AND ROUTING MACHINE.

produced a valuable and efficient tool. The milling cutter rotating upon a horizontal shaft is recognized as a most satisfactory means of forming keyways of almost any length. This cutter, however, cannot form a complete key seat of definite length without overrunning the desired distance with a partial cut. This feature is a material disadvantage when marring of the shaft beyond the necessary key way length must be avoided, or when one or both ends of the key seat are wanted to fit a feather or drop key. For recouping these features of the matter the addition of a vertical spindle for carrying and rotating an end milling cutter, by means of which the incomplete job of the horizontal miller may be finished, has been made in this machine.

Here is a small but heavy horizontal milling machine, the cutter arbor driven by gearing in the usual way and the table traversed by rack and pinion, actuated by a suitably arranged feeding mechanism, clearly shown in

large spindle gear is 20 inches in diameter, $2\frac{1}{2}$ inches face, 6 pitch. As already noted, the countershaft provides two speeds for the spindles, and additional changes are provided for in the gearing connections.

The main cross rail and the vertical routing spindle are provided with independent elevating screws, controlled by pilot hand wheels seen at the top of the machine. By rotation of these hand wheels the center line of the main spindle may be brought within $1\frac{1}{8}$ inches of the table surface, and may be elevated to a height of $11\frac{1}{2}$ inches above it. Thus its total vertical travel is $11\frac{3}{8}$ inches. The router spindle has a total independent vertical adjustment of $3\frac{1}{4}$ inches, which, in combination with that of the cross rail, enables it to be lowered to touch the platen or raised to a clear height of $13\frac{3}{8}$ inches above it. The router spindle also has an independent horizontal travel of $3\frac{1}{8}$ inches, controlled by the balanced crank handle at the upper right hand

corner of the cross rail. The horizontal spindle is of crucible steel, 3 inches in diameter in the gear and through the main bearing. Cutters with standard hole— $1\frac{1}{2}$ inches diameter—and up to 5 inches outer diameter may be used. The router spindle has a No. 7 Brown & Sharpe standard taper hole.

The table, or platen, is 9 x 48 inches in size, has three T-slots and is provided with oil channels and pockets. The length of traverse of the platen is 48 inches, an automatic trip releasing the feed driving gearing at any desired point or at the limit of the travel. The feed gearing is quite fully illustrated in the engraving, showing the step cone pulleys which provide three of the total of 12 speed changes for each of the two spindle speeds. The first of these step cones is arranged for driving at four speeds for each spindle speed, thus making the 12 changes mentioned. The double worm gearing, through the vertical shaft shown, drives at a greatly reduced speed the loose half of the dental clutch on the horizontal shaft carrying the pinion meshing with the rack underneath the platen. The clutch may be engaged or released by hand, and may be released by the stop dog secured at any desired point of the length of the slot in the side of the platen.

For supplying lubricant to the cutters a rotary oil pump and a flexible tubing system are provided. The pump is attached to the base of the machine at the floor, as shown, and is driven by belt from the horizontal worm shaft of the feed mechanism.

The limits of size of work are set by the space between the housings and beneath the spindle bearing at its maximum elevation. This space is 10 $\frac{1}{2}$ inches wide and 9 $\frac{1}{2}$ inches high. The highest center distance of the spindle above the platen being 11 $\frac{1}{2}$ inches, as stated, the largest shaft diameter which may be accommodated underneath a 5-inch cutter is 9 inches. The rated capacity of the machine is said to be the cutting of a key way of standard dimensions in a steel shaft 6 inches in diameter. Keyways may be cut simultaneously in two 3-inch shafts, or in three 2-inch ones.

The machine is furnished either with or without the vertical routing spindle. The weight complete with the routing attachment is stated to be about 3200 pounds, while omission of the attachment reduces this amount by 200 pounds. The designers and builders are John T. Burr & Son, Kent avenue and South Sixth street, Brooklyn, N. Y.

The Pacific Coast Iron Trade.

SAN FRANCISCO, CAL., December 18, 1903.—The imports of pig iron from abroad have been particularly large this fall; in fact, much larger than for many a year, as Eastern pig iron has been for months somewhat of a rarity in our markets. The fall in the prices of iron and steel will be a benefit to all the California industries in which they figure as raw material. Our foundrymen and builders in particular will be grateful. This year, according to statistics kept here, will show an expenditure of over \$17,000,000 in new buildings, a big increase over any other year in our history.

The "Nantes," from Hull, recently brought 1000 tons of pig iron, and the "Earnmount," from Newcastle-on-Tyne, 1300 tons. The "Abydos," from Hamburg, had a large quantity of merchant iron. The imports of pig iron for the five months ending November 1 were 14,784 tons, as against 11,428 tons for the same time last year. The total for the year will much exceed that for 1902. With the development of our iron and steel industries during the past year there is good hope that we shall be able to successfully manufacture some of this class of material, instead of importing it. With the development of our oil fields, which this year have yielded over 20,000,000 barrels, there should be some means found of using it in the reduction of iron ores from Shasta and Madera. We have been promised it for a long time, but the promises have all failed to materialize as yet. But it was some time before we were able to manufacture pipe or do anything satisfactory in the way of making wire rope and other materials of that nature so as to compete with the East, but at last the man and the occa-

sion came, and now we are practically independent in this regard.

Our export trade keeps up, principally to Australia and China and Japan. Our late exports of machinery to Australia and the Hawaiian Islands have been heavy, and we have also sent a great deal of pipe to the latter. Our exports of bicycles to Australia have been very large, especially by the last steamer. J. O. L.

A Court of Patent Appeals Proposed.

WASHINGTON, D. C., December 29, 1903.—A bill providing for the establishment of a court for the adjudication of all controversies arising over patents, trade-marks or copyrights was presented in the Senate a few days before the holiday recess by Senator Platt of Connecticut, and an attempt will be made early in January to secure a favorable report upon the measure from the Senate Committee on Patents. The purpose of the bill is to create a tribunal composed of judges having an expert knowledge of the patent laws, and such familiarity with the arts and sciences as will enable them to deal intelligently with the important technical questions which usually underlie actions relating to patents, trade-marks, &c.

Terms of the Bill.

The bill in question, known as S. 2632, "for the establishment of a court of patent appeals and for other purposes," provides for the creation of a court to consist of a chief justice and four associate justices, of whom any three may constitute a quorum, and which shall be a court of record with original and appellate jurisdiction. The term of the court is to be held annually at Washington, beginning the second Monday in October. The chief justice and his associate justices are to be appointed by the President, with the advice and consent of the Senate. They are to be "learned in the law and in the practice and rules of decisions of the patent law and the law of copyrights." A salary of \$7500 is to be paid to the chief justice, while the associate justices are to receive \$7000 each. The tenure of office will be for life or during good behavior, with the same regulations as to retirement that now prevail as to the United States Supreme Court.

The original jurisdiction of the court of patent appeals is limited to suits in equity brought by patentees, their assigns or legal representatives against the United States for infringement of any letters patent where the cause of action accrues less than six years prior to the filing of the bill of complaint. All previous existing laws relative to suits in equity for the infringement of patent right are to apply to such suits, except that no injunction may be issued to prohibit the use of the alleged invention in the service of the United States. Upon rendering its decrees, finding infringement and adjudging the letters patent in suit to be good and valid, it is provided that the court shall award to the owners thereof such sum of money as may seem just, such award to be in full for the use of the invention by the United States during the entire term of the letters patent. The court is required in rendering its decisions to state separately its findings of fact and its conclusions of law, and the latter only may be reviewed by the United States Supreme Court. The judgments of the court of patent appeals in such cases are to be certified to Congress for appropriation in the same manner as is now followed by the Court of Claims.

Appellate Jurisdiction.

The appellate jurisdiction of the court covers the entire field of patent litigation, and is defined in the following sections of the bill:

Section 5. That the court of patent appeals established by this act shall exercise appellate jurisdiction to review by appeal or writ of error final decisions in the Circuit Courts of the United States, the Territorial or other courts of first instance having jurisdiction of patent or copyright causes, and the Supreme Court of the District of Columbia in all cases involving the validity or infringement of or the title to any letters patent of the United States for any invention or discovery, in all suits brought by the United States seeking the cancellation of any letters patent for any invention or discovery, and in all cases involving the validity or infringement of or the title to any copy-

right protected by the laws of the United States. The decisions of the court of patent appeals in any case within its jurisdiction shall be final.

On any subject within its appellate jurisdiction the court of patent appeals, at any time before entering its final order or decree disposing of a case, may certify to the Supreme Court of the United States any questions or propositions of law concerning which it desires the instruction of that court for its proper decision. And thereupon the Supreme Court of the United States may either give its instruction on the questions certified to it, which shall be binding on the court of patent appeals in such case, or it may require the whole record and cause to be sent up to it for its consideration, and thereupon shall decide the whole matter in controversy in the same manner as if it had been brought there for review by writ of error or appeal: Provided, That in any case made final in the court of patent appeals it shall be competent for the Supreme Court of the United States to require, by certiorari or otherwise, the case to be certified to that court for its review and determination, with the same power and authority as if the case had been carried thereto by appeal or writ of error.

Sec. 6. That an appeal may be taken from the ultimate tribunal of the Patent Office as now existing, or as hereafter established by law, to the court of patent appeals created by this act, under such rules as the court may establish, in any *ex parte* case in which the final decision of such tribunal refuses to issue letters patent to the appellant for the supposed invention or discovery defined in the claims annexed to his specification, or in any of them; or in any interference case in which the final decision of such tribunal awards priority to another than the appellant; or in any interference case where such final decision awards priority to the appellant, but refuses to issue to him letters patent for his invention or discovery as defined in the interference issue or issues or any of them. In interference cases all parties may be heard in person or by counsel, and in *ex parte* cases the court may hear counsel for the Commissioner of Patents in opposition to the grant of letters patent. A certified copy of the decision of the court shall be filed by the appellant with the Commissioner of Patents, and shall govern the further conduct of the case. In *ex parte* cases the appellant shall pay the entire costs of the appeal; in interference cases the court may award costs in whole or in part, or may apportion them among the parties as to it shall seem just: Provided, That the United States shall pay no costs.

Transfer of Cases.

The bill provides for the transfer to the court of patent appeals of all cases that may be pending in the courts upon the organization of the proposed tribunal. No appeal, by writ of error or otherwise, shall afterward be taken from a circuit court to a circuit court of appeals, nor shall any appeal be taken from a Territorial court of first instance to any appellate tribunal other than the court of patent appeals; nor shall any appeal be taken from the Supreme Court of the District of Columbia or from the Commissioner of Patents to the Court of Appeals for the District of Columbia as at present; provided, however, that cases that may be docketed before the date to be fixed upon the passage of this act shall be proceeded with by existing courts with the same power and authority as if this act had not been passed. Other provisions are made for the issuance of writs of error, for the preparation of records and for the housing of the new court.

Much attention has been drawn to this bill because of the fact that it has been introduced by Senator Platt of Connecticut, for many years chairman of the Senate Committee on Patents, a post now occupied by Senator Kittredge of South Dakota. The Connecticut Senator is regarded as a thorough expert in patent law and procedure, and his advocacy of this measure will give it great weight in both houses of Congress. The patent committees of the House and Senate will be asked to give hearings upon several measures after the holiday recess, and it is expected that the bill for the creation of a court of patent appeals will be among those urged for a favorable report.

W. L. C.

A. V. Kaiser of the firm of A. V. Kaiser & Co., Philadelphia, has just returned from Cuba, where he has spent the past 12 months looking after the dismantling of the Cuban Steel Ore Company's plant at Chirioico, Cuba. It will be remembered that this firm purchased the whole plant a little over a year ago, nearly all of which was reshipped to the United States and sold, with the exception of about 80 hopper ore cars of 8000 pounds capacity and a 50-foot double track standard steel bridge. The large pier and viaduct were sold to the Bethlehem Steel Company, to be used by them in connection with the mines they purchased from the Juragua Iron Company.

Notes from Great Britain.

The State of Trade.

LONDON, December 19, 1903.—The amount of business doing at the present moment is insignificant. Next week a number of mills will be closing down, and it is probable that they will barely be in working order before the new year. It is hoped that with the turn of the year trade will be a little more brisk. In any event, in closing down for the Christmas holiday producers are more hopeful than they have been for some weeks. There is a feeling, whether justified or not, that we are near the end of what is sardonically termed the "seasonal stagnation." Standard prices remain purely nominal, and have practically no relation to actuality. If standard prices are misleading, wages ascertainties are valuable indices to the trend of trade. Compared with the previous audits and those for the corresponding periods of last year, prices show but a slight decline, the fall being most marked in the case of West of Scotland pig iron, the price of which is 10 per cent. lower than a year ago. As a result of these ascertainties no change has been made in the wages of the work people employed in the Midlands, North of England and West of Scotland iron works.

The last official reports on the condition of the mineral, iron and steel trades for this year are to hand. They bring us down to the end of November, and as December is a broken month owing to the Christmas holidays, they probably give the most accurate indication of the present state of trade. Summed up they are as follows:

Employment in coal mining during November showed little change compared with a month ago, but was not so good as a year ago. Employment in iron mining continues good. Employment in the pig iron industry shows, on the whole; no change compared with a month ago; but, as compared with a year ago, there has been a decline, mainly in the Cumberland and North Lancashire district. Employment in iron and steel manufacture continues to show a falling off compared with a month ago and a year ago. Employment in tin plate manufacture shows little change compared with October, and continues worse than a year ago. Employment in the engineering trades generally is bad, worse than a month ago and a year ago. Employment in the shipbuilding trades is bad, worse than a month ago and considerably worse than a year ago.

Going a little more into detail, returns relating to the works of 113 ironmasters show that 314 blast furnaces were in operation at the end of November, as compared with 324 a year ago. For finished iron and steel works returns furnished by employers respecting 199 works show that they employed 799 less than a year ago.

The following reports relating to the different branches of the iron and steel manufacturing industry have been furnished by local correspondents and others:

Tyne and Wear District.—Employment with steel smelters has been fair. Plate mills generally have worked full time, and bar, cogging and sheet mills less than full time. At forges employment was moderate, and at finished iron and steel works bad.

Cleveland and Hartlepool District.—With Hartlepool iron and steel workers employment has been good, and better than a month ago and a year ago. At rail mills and metal expansion works employment continues good. At plate and angle mills it is moderate.

South Yorkshire.—With Siemens steel smelters employment is moderate, and with steel workers at Parkgate fairly good, but the steel trade on the whole is slack. With iron workers employment is bad at Parkgate, and moderate at Rotherham and Masboro'. Employment with steel workers at Leeds is worse than a month ago, rolling mills and finishing departments being on short time. At Bolton (Lancs.) employment with steel smelters is slack.

Midlands.—In certain works in Derbyshire nearly full time is being worked in the iron department, and less than half time in rolling mills. Steel smelters in

South Staffordshire are working full time, but employment at iron works has declined in some branches. In Shropshire employment with iron and steel workers was fairly good, and moderate in the West Bromwich and Smethwick district.

North and South Wales.—Employment with steel workers in North Wales has been fully maintained. In South Wales employment has been fairly good, except at works stopped for the renewal of plant.

Scotland.—Employment with steel smelters and iron and steel workers has been fair generally, but slack at most of the malleable iron works.

The Shipbuilding Trades.

Compared with a month ago trade union reports for most districts show a decline in the number of men employed, but some improvement is indicated on the South Coast. As compared with a year ago a still greater decline is shown in most districts, but there has been considerable improvement in the Tees and Bristol Channel districts. On the Tyne employment is bad, and worse than a month ago and a year ago. At several firms three-quarter time is being worked. On the Wear employment is very bad, and worse than a month and a year ago. In the Tees and Hartlepool district employment with boilermakers, though bad, is slightly better than a month ago, and much better than a year ago. On the Humber employment is very slack, and much worse than a month and a year ago. Some short time is reported. On the Thames there has been a considerable decline as compared with the previous month, and employment is also worse than a year ago. Generally it is bad, but it is reported fair at Sheerness, good at Chatham.

At Portsmouth and Devonport, on the South Coast, employment is good with shipwrights; with iron shipbuilders it is reported as slack at the former, as moderate at the latter place. Employment is dull at Plymouth. At Southampton fewer men are unemployed than a month ago, but short time is still reported, and employment remains bad and worse than a year ago. At the Bristol Channel ports employment generally is bad, rather worse than a month ago, but not so bad as a year ago. Shipwrights at Pembroke Dock report it as good. At Bristol it was fair until the last week of the month, when it became bad. On the Mersey employment shows little change as compared with the previous month.

On the Clyde employment on the whole is bad, worse than a month ago and much worse than a year ago. A few branches, however, report it as fair. Some short time is reported. On the East Coast of Scotland employment generally is very bad, worse than a month ago, and very much worse than a year ago, especially at Dundee, where much shorter time is reported. At Belfast employment is quieter than a month ago and not so good as a year ago.

At Barrow employment shows little change as compared with the previous month, but is worse than a year ago. At Yarmouth and Lowestoft employment is fair; at Cowes it is dull. At Dublin it is fair with shipwrights.

The Engineering Trades.

Information obtained from employers' associations, trade unions and other sources points unmistakably to the fact that the state of the engineering trades is bad and worse than a month and a year ago. Nearly all the districts show more or less decline as compared with a month and a year ago, with some short time in places. The returns, however, indicate some improvement in the Belfast and Dublin district as compared with a month ago, and in the Northeast Coast, London and South Wales and Bristol districts as compared with a year ago.

Northeast Coast.—Employment generally is bad and rather worse than a month ago, and some shops are working short time. It is, however, moderate with some sections in the Newcastle district, and at Gateshead pattern makers report it as improving. At Hartlepool and Stockton pattern makers report employment as moderate. At Middlesbrough it is good with ironfounders, moderate with engineers. At Stockton it is moderate with ironfounders; with engineers, though dull, it is much better than a year ago. Machine workers at Sunderland report employment as fair. With boilermakers at Dar-

lington it is moderate. In the Tees district bridge builders report employment as good and better than a year ago. On the Tyne and Wear enginemen and firemen report employment as fair.

Manchester and Liverpool District.—Employment generally is dull and worse than a month and a year ago. At Manchester nearly all branches are slack, and core makers report employment as declining; with machine workers it is stated to be fair. At Crewe short time is being worked. In the Liverpool district brassfounders and hammermen report employment as good; with most other branches it is dull.

East Midlands.—The general state of employment is dull, and worse than a month ago and a year ago. In general engineering work it is bad, and at Derby boiler-makers report short time. With lace and hosiery machine builders at Nottingham employment is reported as fairly good, with lace machine builders at Long Eaton as moderate, and with boot and shoe machinery makers at Leicester as fairly good.

West Midlands.—Employment shows a slight decline as compared with the previous month, and is not as good as a year ago. Generally it is moderate. At Coventry it is fair with pattern makers and tool makers, good with ironfounders, bad with engineers. With boiler-makers it is slack at Birmingham, moderate elsewhere. With ironfounders it is bad at Wolverhampton and Dudley. With electrical engineers it is fairly good. Employment at Birmingham is quiet with military gun makers, fair with sporting gun makers. In the cycle industry it is moderate at Coventry, quiet at Redditch; in the motor industry very fair.

South Wales and Bristol District.—Employment generally is rather worse than a month ago, but better than a year ago. At Swindon it is moderate. At Bristol it is dull with iron and brass founders, moderate with engineers and boilermakers. At Swansea and Newport engineers report employment as bad.

The Chamberlain Tariff Commission

A distinct *fait nouveau* has to be announced this week in connection with the fiscal agitation. Speaking at Leeds last Wednesday, Mr. Chamberlain said:

We are going to form—we have gone a long way in the direction of forming—a commission, not a political commission, but a nonpolitical commission of experts, to consider the conditions of our trade and the remedies which are to be found for it. This commission will comprise leading representatives of every principal industry and of every group of industries, representative of the trade of India and the crown colonies and the great self governing colonies. It will invite before it witnesses from every trade, and it will endeavor, after hearing all that can be said, not merely in regard to the special interests of any particular trade, but also in regard to the interests of all the other trades which may be in any sense related to it—it is going after that to frame a model tariff. You know the principle I laid down at Glasgow was that we should have a tariff averaging 10 per cent. on manufactures, and that that tariff should be arranged so as to put the highest rate of duty on the imports which have most labor in them as compared with partly manufactured goods the importation of which does not deprive us of so much employment. Now, whenever the country is ready to give us the mandate for which we ask and a Government is in power which is prepared to accept our principles, we will have ready all the information, or at all events a great part of the information, that it will desire, and it will have before it, at all events, a tariff which has been presented to the country, and upon which the people have had every opportunity of expressing their opinion.

The first list of names of this commission has now been published, and the most striking fact in connection with it is the presence of an unusually large number of iron and steel and engineering magnates.

Charles Allen is a nephew of the late Sir Henry Bessemer, and has been associated with the heavy steel trades since the early days of both the Bessemer and Siemens processes of making steel. Some ten years ago he became connected with the Ebbw Vale Steel, Iron & Coal Company, Limited, and is managing director of the concern. He is also vice-president of the Sheffield and Hallamshire Bank, Limited. Sir Alfred Hickman, M. P., for Wolverhampton West, is an ex-president of the British Iron Trade Association, chairman of the firm of Alfred Hickman, Limited, member of the council of the Iron and Steel Institute, and also of the Mining Association of Great Britain. Arthur Keen is chairman and

managing director of Guest, Keen & Nettlefolds, Limited; a director of Bolckow, Vaughan & Co., ironworkers and colliery owners; chairman of the London City & Midland Bank; vice-president of the Institute of Mechanical Engineers, and vice-president of the Iron and Steel Institute. Sir William Thomas Lewis is a large employer of labor in connection with collieries and manufactories in South Wales, past president of the Mining Association of Great Britain, past president of the Institute of Mining Engineers, and vice-president of the Iron and Steel Institute. Sir Andrew Noble is vice-chairman of Sir W. G. Armstrong, Whitworth & Co., Limited. The Hon. Charles Parsons, who has developed the steam turbine and made it suitable for the generation of electricity and the propulsion of war and mercantile vessels, is proprietor of the electrical and engineering works of C. A. Parsons & Co. at Heaton, Newcastle-on-Tyne, and is managing director of the Parsons Marine Steam Turbine Company and the Newcastle & District Electric Lighting Company. Other names known to Americans are Charles Booth, whose statistical inquiries into the condition of the British population have become classics, and Alfred Mosely, whose commissions to America have made him known to many on your side. W. A. S. Hewins, until recently Director of the London School of Economics, and Professor of Economic Science and Statistics at King's College, who resigned these posts in order to co-operate with Mr. Chamberlain, will act as secretary.

A Large Forged Screw.

W. Somers & Co., Haywood Forge, Hales Owen, have just completed a forging which, it is said, holds the world's record. It is a gigantic screw 85 feet 7 inches long and 11½ inches in diameter, and has been forged for a 150-ton "sheer leg," a mechanical contrivance used in dockyards for lifting heavy weights which are beyond the power of ordinary cranes. It was forged from one ingot of steel, has a 2-inch thread extending nearly its entire length, and is 17½ tons in weight. This piece of workmanship is regarded as a triumph of English, and particularly Midland, engineering skill. There are only a very few places where these long screws can be cut, and the one just completed by W. Somers & Co. is believed to be the largest ever made under a hammer. S. G. H.

The British Westinghouse Company.

LONDON, December 19, 1903.—There has been considerable doubt as to whether the British Westinghouse Company would pay the preference dividend. These doubts crystallized in a fall in the shares to £4½. At one time these preference shares had been worth £6¼. The shareholders will, however, receive their dividend, although for some time the directors hesitated whether they ought not to reduce the bank overdraft and pass the dividend. From a recent visit to the works I gained the impression that the company were busy, although they had facilities for turning out more than they were doing. H. S. Loud, the general manager of the company, who is well known to many American iron and steel men, told me they were employing last week over 6000 men, but that they could, when pressed, utilize the labor of 10,000.

It is now possible to take a clear view of the present position of the British Westinghouse Company. The company were formed to establish on a larger scale than had hitherto been done in this country works for the manufacture of electrical machinery and appliances, and the rights and patents for the United Kingdom and its colonies, except Canada, were acquired from the American parent company. Further, for a period of ten years the American company agreed to communicate all improvements they may make and supply all plans, specifications and information to the British company; in short, closely to co-operate. The American company guaranteed that the profits resulting from the business for the period ending August 1, 1902, should amount to a sum not less than sufficient to pay 6 per cent. dividend on the preference shares. The price paid to the American company was £500,000 in ordinary shares. The capital of the British company was fixed at £1,500,000, divided into £1,000,000, 6 per cent. preference shares and £500,000 ordinary shares. A further issue of 25,000

ordinary shares was made in August, 1899, to the Westinghouse Machine Company of Pittsburgh, to purchase that company's business for the manufacture of gas engines for the United Kingdom and its colonies, except Canada. This company joined with the Westinghouse Electric & Mfg. Company in guaranteeing the payment of a 6 per cent. dividend on the preference shares of the British Westinghouse Company over the period ending August 1, 1902. In March, 1902, an issue of £500,000, 4 per cent. mortgage debenture stock was made, since increased to £566,353, and last year the preference capital was increased to £2,000,000; so that the capital of the company at the present time consists as follows:

300,000 6 per cent. preference shares, fully paid....	£1,500,000
100,000 6 per cent. preference shares, £1½ paid.....	150,000
Installments paid in advance.....	98,065
Total preference capital.....	£1,748,065
Ordinary shares, fully paid.....	750,000
4 per cent. debenture stock.....	566,353
Total.....	£3,064,418

On July 31 of this year a temporary loan of £141,250 was on the books, while creditors amounted to £540,839. Thus the company are once more short of working capital. The report issued this week states that "In order to make provision for maintaining a sufficient supply of stock at the company's works, and for other purposes to meet the requirements of the increasing business of the company, the directors will propose to the meeting that an additional 100,000 6 per cent. preference shares of £5 each, ranking *pari passu* with those already existing, shall be created. Arrangements have been made under which the subscription to these shares will be assured."

Financial men over here think that the amount asked for is insufficient to place the British company on a thoroughly satisfactory basis, and that probably a further capital will be required. As to the growth of the business, there can be no doubt of it, judged by the following:

Orders received during the year ended July 31, 1899..	£279,000
July 31, 1900.....	547,000
July 31, 1901.....	738,000
July 31, 1902.....	932,000
July 31, 1903.....	1,657,114

The first year of the company's working ended in a profit of £10,777. The following year there was an improvement, the figures rising to £49,533. In the following year the profits rose to £60,686, while for last year there was a trading profit of £107,609, which "includes about £60,000 special discounts allowed by the American companies on orders executed at Pittsburgh. It was felt by the American companies that these discounts should be made in view of the fact that the Manchester factory could turn out only about one-third of the electrical apparatus needed for its orders, and had therefore to purchase the balance from the Pittsburgh factories."

The report specifies a number of important contracts secured during the past year. The works have been planned on such a scale that it is in a position to take on the largest possible contract, and therefore should be able to work at the lowest cost. S. G. H.

The Lebanon Chain Works Are Now Attwood Chain Works.

Eli Attwood, formerly president and general manager of the Lebanon Chain Works, Lebanon, Pa., has purchased the Lebanon Chain Works from the Standard Chain Company, and they will be known as the Attwood Chain Works until the Standard Chain Company have abandoned the name of the Lebanon Chain Works, a matter of several weeks, when papers will be filed to secure the old name.

All patents pertaining to the new link bending machine, of which Mr. Attwood is patentee, were included in the sale, thus enabling the new company to meet the requirements of the trade for side welded chain up to and including 3½-inch diameter iron, manufacturing all sizes in hand made from ¼-inch diameter iron to 3½-inch. They will not only carry in stock large quantities of chain of standard dimensions, but, with the arrangement of their plants and number of chain fires, are in position to meet the demands of the trade for hurried

orders for special dimension chain, such as to fit the English windlasses and other old dimensions.

Their best special dredge chain is used by the largest dredging concerns, as well as by mine operators in slopes and on steam shovels, where durability and great strength are demanded. On light vessel chain for the Government they claim to hold the highest test in the world. In this test a 2-inch diameter iron chain pulled 300,000 pounds without breaking, which was 50,000 pounds above the required test. The record was taken by a Government inspector, which can be verified by the Third Lighthouse District, Tompkinsville, N. Y., for whom the chain was manufactured.

The Fox Double Polishing Stand.

Radical departures from standard practice are not common in the construction of new machines for rotating the polishing and buffing wheels used by platers and others. Our engravings, however, show a distinctly unique type of this class of machinery, involving features

ing position. Adjacent to the arbor pulley, Fig. 1, is a brake wheel, against which bears a brake shoe attached to the column. This braking device is brought into action when the arbor yoke is raised, and is effective in bringing the arbor quickly to a full stop. The makers state that no special countershaft is required with the machine, as the arbor yoke movement enables the operator to drive the wheels at any desired speed. The arbor is made of best machinery steel, accurately ground to size and running in thoroughly dust proof roller bearings. The center line of the arbor is normally 35 inches above the floor, and is 10 inches forward of the center line of the column. The driving pulley is 4 inches in diameter and its face width between flanges is suitable for a 4-inch belt. The arbor is 1½ inches in diameter through the bearings and 1 inch at the wheel seats. Over all length of the arbor, tip to tip of the tapered spindle ends when in place, is 44 inches; space between inner wheel faces, collar to collar, is 28¼ inches; maximum wheel thickness provided for between collar faces is 4¼ inches. With the pointed spindles removed, the over all width of the

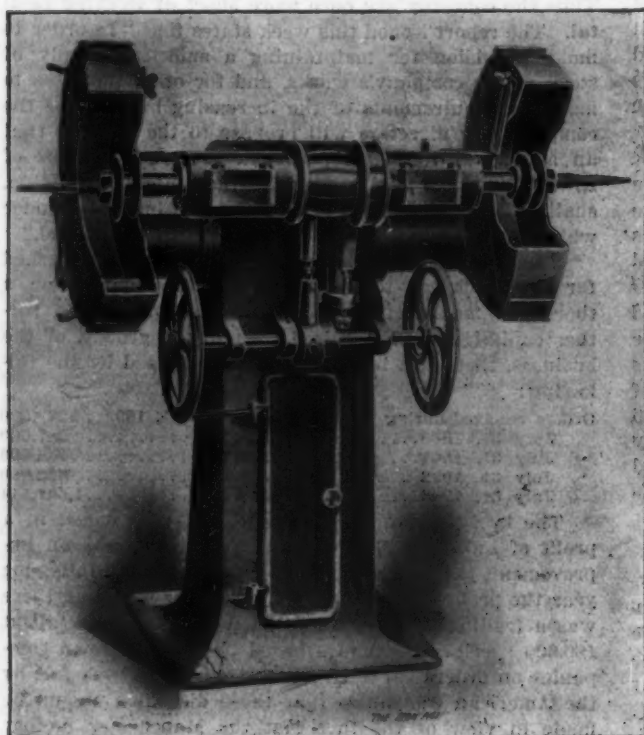


Fig. 1.—Front View, Showing Hoods in Place.



Fig. 2.—Side View, One Hood Removed.

THE FOX DOUBLE POLISHING STAND.

believed to be in advance of previous designs heretofore brought out. The arbor is carried in a yoke which is hung by a form of hinge connection with the top of the column. This arrangement makes possible the realization of a number of advantageous features, all more or less dependent upon the swinging yoke feature as a basis. For one thing, the speed of the arbor may be made to vary from nothing up to that corresponding to the rate of travel of the driving belt itself. As shown in Fig. 2, the swinging yoke is in a nearly horizontal position.

The forward end of the yoke is supported from the hand wheel shaft below by means of an eccentric and rod. The rod is adjustable, having a right and left threaded connecting piece midway of its length. Rotation of the hand wheel shaft causes vertical movement of the arbor through a distance slightly greater than the total throw of the eccentric. Thus the arbor pulley may, by its rise and fall, loosen and tighten its driving belt so as to allow complete stoppage of the polishing wheels or full speed corresponding to the rate of travel of the belt. The provision of two hand wheels, one for each polishing wheel, enables the operator at either side to start or stop the machine at will without moving from his work-

machine is the measurement outside of the hoods, which is 36 inches.

The hoods, or dust collectors, are of substantial construction, bolted to the column and readily detachable. The column is hollow, and at side and back are openings, from either of which piping may be led to an exhaustor fan for removal of the dust. In Fig. 2 one hood is shown removed. The upper hole in the column is for attachment of this hood; the lower one is for the exhaustor piping. The second exhaust opening is at the rear, the engraving showing a pipe leading from it. A third method of dust removal, and perhaps the most desirable one when feasible, is that downward through the column and floor. This plan is in use in the works of the makers of the machine and is stated by them to have proved itself the cleanest and least obstructing method.

The machine is said to weigh about 450 pounds. The builders are the Fox Machine Company, North Front and Fourth streets, Grand Rapids, Mich.

There were 13 boiler explosions in Indiana this year with seven fatalities and 27 people injured. Last year

there were ten explosions. Factory Inspector D. H. McAbee will renew his effort at the next session of the Legislature to get a law passed requiring stationary engineers to have licenses. A skilled boilermaker recently told the inspector that he makes his living repairing boilers, and had been amazed to find evidences of the most careless repairing, likely to endanger life. At present there is no State law regulating the running of engines, although some of the cities have local laws for that purpose.

The Appraisement of Imported Machinery.

WASHINGTON, D. C., December 29, 1903.—As the result of an investigation of the methods in force at the port of Boston for the examination and appraisement of heavy machinery, the Treasury Department now has in contemplation the preparation of new regulations that will provide important changes in the existing practice at all ports. The reports received by the Department indicate that the present system is so defective that the Government is liable at any time to incur a heavy loss in revenue through the carelessness or ignorance of its examiners or the dishonesty of importers.

The appraisement of heavy machinery has always presented a serious problem to the Treasury Department. In condition as imported it is not always possible for the most accomplished expert to properly assess the valuation, and the cost of transportation to and from the appraisers' stores is so great as to prohibit the application to machinery of the methods employed in the examination of other merchandise of less weight and bulk. These facts were recognized by the Treasury Department several years ago, and under date of June 8, 1895, the Department issued a special regulation for the guidance of collectors of customs at all ports. The appraising officers had reported that no effective examination could be made unless the various parts of the machine were connected and set up, and that this process was impracticable at the appraisers' stores. The regulations provided that whenever the importer should notify the collector of his wish to have the appraisement completed after the machinery had been set up at its place of delivery his request might be granted, provided he should file with the collector a bond with approved sureties in which he should stipulate that, in consideration of the privileges accorded to him through such examination, he would consent to regard the same as in all respects valid and binding upon him, and would not set up the fact of such a procedure as a defense against any liabilities or penalties which might accrue therefrom.

It was further ordered that every invoice of such machinery, whenever comprising two or more packages, should be referred to the examiner of machinery at the appraiser's office, who should indicate in writing upon the invoice any particular package or packages on such invoice for examination upon the wharf, after which such package or packages should be subjected to a preliminary examination to ascertain the character of the contents and their general conformity with the specifications on the invoice. On the filing of the bond referred to collectors were authorized to deliver all the packages to the importer to be forwarded to the place of final destination, with the understanding that the machinery should be set up within 30 days, after which an examiner should proceed, at the expense of the importer, to the plant in question and complete the final examination and appraisement. Subsequently the Department prepared a form of bond to be given by the importer, conditioned upon the notification to the collector within 30 days after the receipt of machinery that the same was ready for inspection, the payment of all duties and penalties and all expenses incurred by the examiner.

It will be noted that under the practice thus authorized the machinery in question was "entered for consumption" and the estimated duties collected and paid thereon at the port of importation, and that the goods were not forwarded to the place of destination under the usual "immediate transportation" bond and delivered to a representative of the customs service at the end of

the journey. As a result, it is alleged that certain importers have availed themselves of the opportunity to defraud the Government, and have withheld from the final inspection important auxiliary parts of machinery and considerable quantities of spare parts. The Treasury authorities have become convinced that the defect in the system is in permitting the importer to take custody of the goods before their final appraisement, and it is to remedy this condition that the Department now proposes to install a new method.

It is understood that the modified system will require that all heavy machinery intended to be appraised after setting up shall be corded and sealed by the examiner upon its arrival at the port of entry, and shall then be forwarded to its destination under a bond given by the importer conditioned upon the seals remaining unbroken until the importer is ready to proceed with the erection, when an examiner shall go to the plant, break the seals and personally supervise the unpacking and erection of the machinery. It is recognized, of course, that in many cases a considerable period of time may be required to put up heavy or intricate machinery, and that occasionally the importer may not be prepared to erect immediately all the machinery received in a single consignment. These drawbacks, however, are not regarded as offsetting the advantage gained by providing constant customs supervision until final appraisement. The item of cost to the importer, if he has to pay the traveling and living expenses of an examiner under the new regulations, will be considerable, and the Department will give consideration to the question as to whether the Government should not properly bear at least a part of this expense, as it will be the sole beneficiary of the innovation. The changes to be made in the regulations will probably be promulgated within the next 30 days.

W. L. C.

Car and Locomotive Output for 1903.

Official returns from all but two car building plants in the United States show that 154,808 cars have been built during the year 1903. As the two firms from whom we have not heard turn out a total of less than 2000 cars, we have estimated their output from our own record of their work and added the sum obtained to the above total. This figure includes all freight and passenger cars built for elevated and steam railroads, exclusive of those built by the railroads at their own shops, and exclusive of those built for street and other electric service. Careful estimates have been made by all the large car plants for their output during the month of December, so the total given above is very nearly correct. Of this total figure, approximately 152,801 are freight cars and 2007 are passenger coaches; 153,195 for domestic use and 1613 for export. Last year the total number of cars built was 164,547, which is about 9700 in excess of this year. The decrease has occurred in the last two months, as up to that time the output for 1903 was equal to the output for the first ten months of 1902.

During the year 5152 locomotives were built at the various locomotive works in the country, as against 4070 last year. This figure is officially correct, as complete returns have been received from every locomotive building plant in the United States. The number includes 88 electric locomotives. The increase over 1902 is the largest that has ever occurred in one year, and is possibly due to the fact that the locomotive works in the country had such a volume of orders placed during 1902 that they were unable to make immediate deliveries, and many of the orders were held over until 1903. Returns from Canada show that 55 locomotives have been built by two firms, one of which has only recently begun operations. In analyzing the report it is interesting to note what this total of 5152 really means, by calculating the expenditure involved. At an average cost per locomotive of \$12,000, the total amount spent by the railroads for motive power would be approximately \$62,000,000. This figure, of course, does not include the locomotives which are built yearly by railroad companies at their own

shops. The following table shows our figures for locomotive building during the last 12 years:

1892.....	2,012	1898.....	1,875
1893.....	2,011	1899.....	2,473
1894.....	695	1900.....	3,153
1895.....	1,101	1901.....	3,384
1896.....	1,175	1902.....	4,070
1897.....	1,251	1903.....	5,152

—The Railroad Gazette.

The Bullard 42-Inch Boring and Turning Mill.

Among features of special interest in the new Bullard 42-inch boring and turning mill are the self contained side drive, permitting the application of a motor in a very economical manner; absolutely independent feeds for each head; and a mechanical quick traverse device for manipulating the saddles and slides in all directions at a speed approximating 10 feet per minute. There is also

brackets, rotating in one direction or the other the vertical side rods, by which the cross rail heads are driven through the regular feed brackets on the back side of the rail, the speed of traverse being about 10 feet per minute. When the levers are in their normal central position these overhead clutches are both disengaged and the feeding mechanism on the lower brackets is automatically engaged with the vertical rods. The construction is such as to make it impossible for the quick traverse device to become engaged at the same time as the feeding mechanism. Should the operator neglect to disengage the feeding mechanism before throwing in the quick traverse no serious results could follow, as when the latter is thrown in the former is automatically thrown out.

The value of the quick traverse may be understood by supposing the machine in use in turning up a gear blank

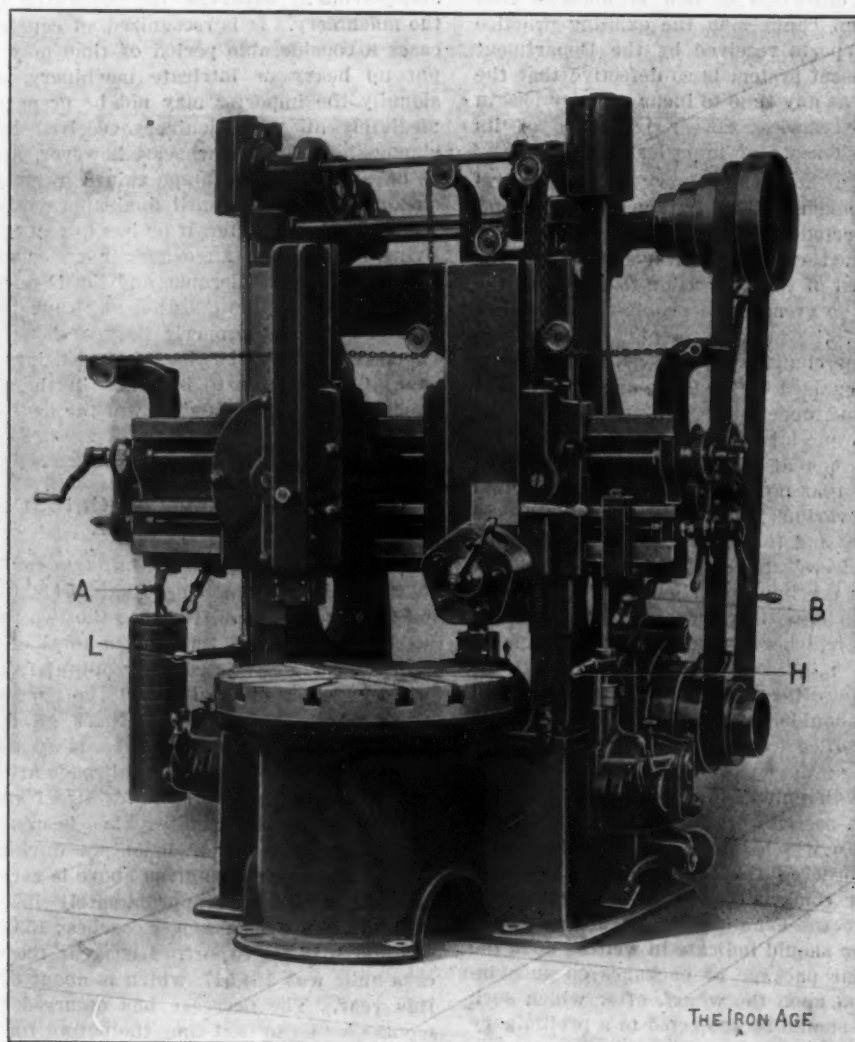


Fig. 1.—Front View, Showing Feed and Traverse Controlling Levers.

THE BULLARD 42-INCH BORING AND TURNING MILL.

supplied an efficient belt shifter, and a foot brake for enabling the operator to stop the machine quickly. All gearing is incased and all high speed journals run in self oiling bearings.

Fitted to the cross rail in the machine shown are one fixed turret head and one swivel head, but two swivel heads may be supplied if required. The power traverse for these heads is obtained by driving the vertical feed rods at a constant high speed from the overhead shaft, and at a variable speed through an independent feed gear box attached to the bed at the right hand side, as seen in Fig. 1. Levers L and H are movable both upward and downward from their normal central positions, as shown in the illustration. Movement of either lever upward or downward engages a clutch mechanism of the expansion type in the bevel gearing at the overhead

which must be faced on both hub and rim. Here the feed mechanism would first be engaged for facing the rim, levers L and H remaining in central position. At the completion of this operation the quick traverse would be engaged by movement of lever L or H, moving the head rapidly over the intervening space between rim and hub at the rate of about 10 feet per minute. Then, upon releasing the lever handle, the quick traverse is at once released, the feed mechanism immediately becomes engaged, and the operation of facing the hub may proceed at once. Briefly stated, then, the mechanism of the machine is such that with the levers L and H in central position the feeding mechanism in the cross rail heads may be used in the regular way at any time; either lever may be raised or lowered so as to disengage the slow feed and throw in the quick traverse for moving the head

rapidly either to right or left, the feeding mechanism being again brought into action by simple release of the lever, allowing it to return to central position. This arrangement applies as well to the vertical and angular feeds and is believed to have a considerable influence upon the productive capacity of the mill. The feeds are positive, having ten changes, ranging from 1-32 to $\frac{3}{4}$ inch horizontally, and from 1-50 to $\frac{1}{2}$ inch in angular and vertical directions.

The chain leading to the head counterweights passes back of the center of the table, this arrangement increasing the general convenience of placing heavy work by means of cranes or tackle. Inasmuch as turret tools of

clutch, the former being engaged by movement of the levers in one direction, while the other is thrown in by movement in the opposite direction. The toggle friction operating the feed mechanism serves a double purpose, giving, as it does, the means of quickly engaging and releasing the feed, while at the same time serving as a safety device to prevent accident in case the heads should be run together by either the quick traverse or the feeding mechanism. As already stated, the screw cutting gearing for the turret head is operated by a positive clutch, the arrangement being such as to provide as fine a feed as may be required for boring a hole, and then, without changing any gears, to enable the operator immediately

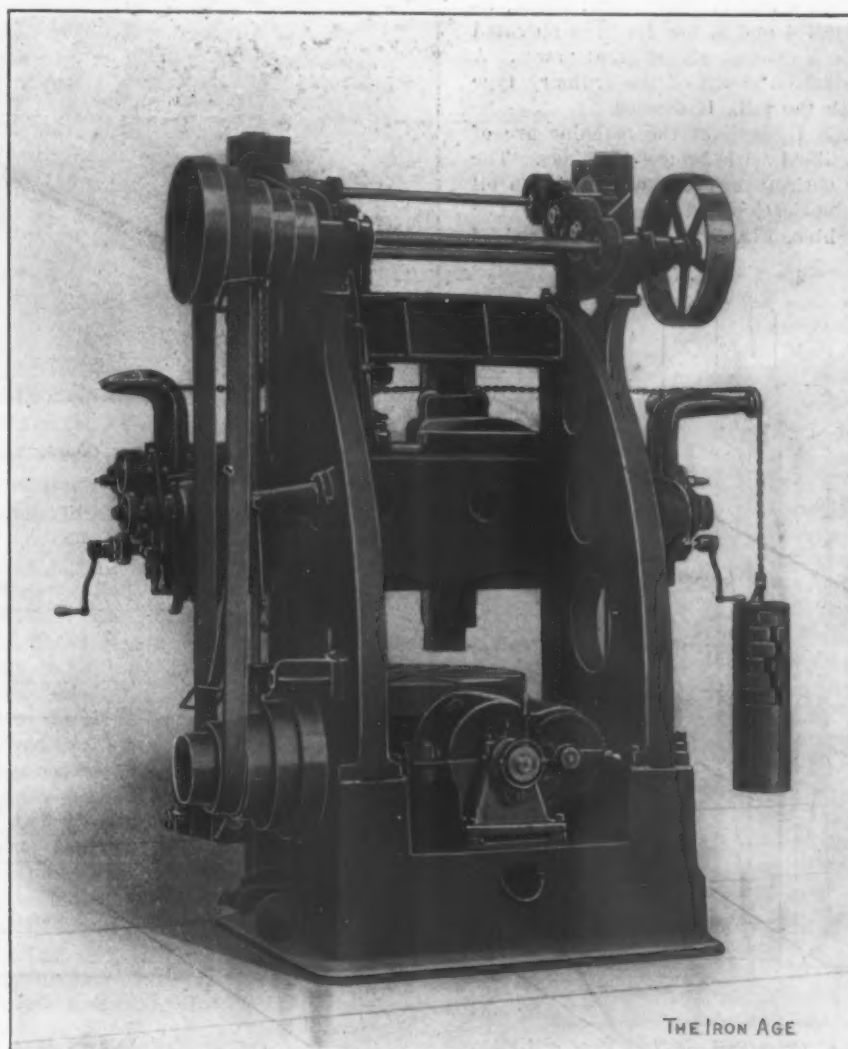


Fig. 2.—Rear View, Showing Motor Mounting and Driving Connections.

BULLARD 42-INCH BORING AND TURNING MILL.

considerable weight may quite likely be used in the fixed turret head, small weights are provided for increasing or decreasing the counterweight attached to this head, as shown at the right of the rear view, Fig. 2. The turret head itself is provided with means for maintaining the vertical alignment of the slide, insuring accurate work at all times. This provision is not necessary in the other head, inasmuch as it is arranged to swivel and the truth of its vertical alignment is a matter of adjustment only.

The turret head is arranged for cutting all standard threads from $2\frac{1}{2}$ to 12 per inch. The screw cutting gearing is independent of the feed mechanism and both sets cannot be engaged at the same time. The regular feed for each head and the screw cutting gearing for the turret head are controlled by the outer levers A and B at the ends of the cross rail. The feed mechanism is operated by a toggle friction, while the screw cutting gearing in the turret head is connected by a positive

to chase the hole with the coarsest thread for which the machine is geared.

The design of the cross rail is illustrated in Fig. 3, which is a view from the left of the machine, Fig. 1 showing the swivel head and slide. The construction here shows evidence of attention to apparently minor details, which, nevertheless, materially assist in securing increased production and in providing means for maintaining the alignment regardless of the severity of the duty required of the machine. The length of the bearing surfaces of the saddle on the rail has been increased from previous designs and the width has been narrowed. Horizontal alignment is obtained at surfaces A and B, with the screw located as nearly central as possible. The saddle is gibbed back against the rail, receiving its thrust at surfaces C and C', and the tension at surface D. The saddle does not bear at surfaces E, but is gibbed between F and G. It will also be noted that the saddle is of the square locked type, having no loose joints, and

that taper steel gibs are used for making all adjustments. This type of bearing is also employed for maintaining the alignment of the cross rail with the right hand upright; the left hand upright acts merely as a support and has nothing to do with the alignment of the cross rail.

The table spindle is of the regular Bullard type, the vertical thrust being taken upon an angular bearing 24 inches in diameter and entirely immersed in oil. An oil gauge, located at the right of the table close to the right hand upright, Fig. 1, enables the operator to see when the supply of lubricant is getting low. The table is provided with parallel slots instead of radial ones, the parallel arrangement being provided to suit the Bullard spiral chuck jaws, Figs. 4 and 5. The spiral chuck, as fully illustrated in Figs. 4 and 5, has its jaws operated by a screw working on a ratchet, giving great power. A plain table and combination chuck of the ordinary type will be furnished with the mill, if desired.

High speed journals throughout the machine are of the ring oiling type, lined with bronze bushings. The head stock gears are entirely incased and run in an oil bath to insure ample lubrication and quiet running. The rear view of the machine, Fig. 2, shows the method of

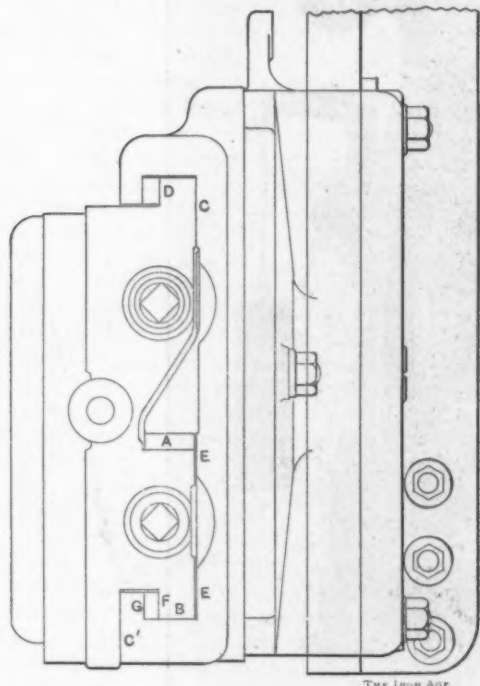


Fig. 3.—Left End View of Cross Rail.—Swivel Head and Slide.

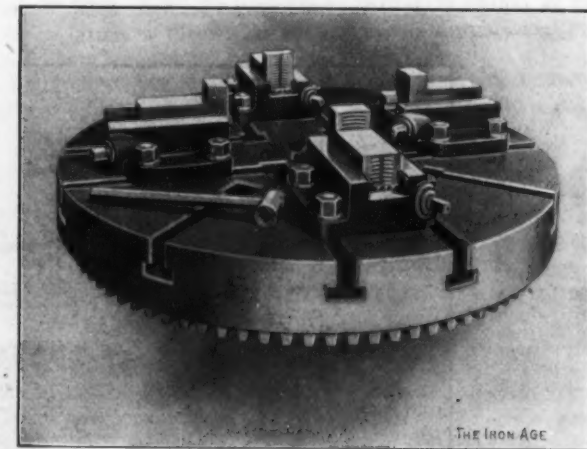


Fig. 4.—Spiral Jaw Chuck.

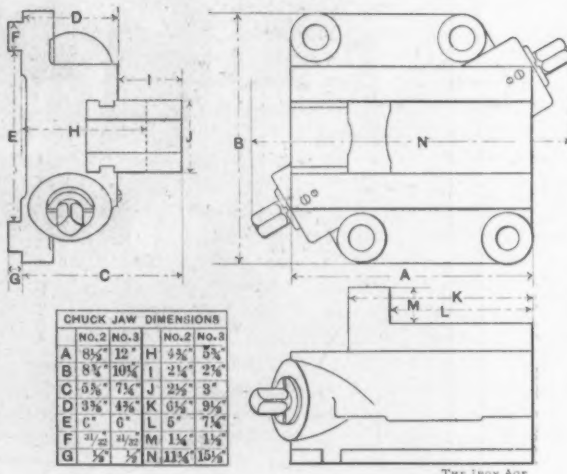


Fig. 5.—Spiral Chuck Jaws.

THE BULLARD 42-INCH BORING AND TURNING MILL.

mounting and connecting the driving motor. The belt shifter, as shown in Figs. 1 and 2, enables the operator of the machine to shift the cone pulley belt from one step to another very quickly, without injury to his hands, while the machine is under full load. The foot brake at the right of the machine, as seen in Fig. 1, acts directly upon the large step of the lower cone pulley and enables the operator to stop the machine at any desired point to suit his convenience in tightening the chuck jaws and truing up the work. Without this brake, the time consumed by the machine in coming gradually to rest would often be quite objectionable. The weight of the mill complete, as shown, is 14,600 pounds, net, as stated by the makers, the Bullard Machine Tool Company of Bridgeport, Conn.

A large number of Pittsburgh manufacturers will have exhibits at the World's Fair, St. Louis, next year. Among the concerns who have already arranged for space are the following: Westinghouse Air Brake Com-

pany, Standard Underground Cable Company, Pressed Steel Car Company, Oil Well Supply Company, Star Encaustic Tile Company, H. J. Heinz Company, Pittsburgh Meter Company, Thomas McKay & Co., W. W. Patterson Company, Ruud Mfg. Company, Penn American Plate Glass Company, Standard Leather Company of Allegheny, Duff Mfg. Company, Conroy, Prugh & Co., Rischke Gottfried Company and the American Locomotive Company. These manufacturers from other parts of Western Pennsylvania will exhibit: American Sterilizer Company of

Erie, Bullock Swing & Chair Mfg. Company of Bellefonte, F. L. Forrester of Slippery Rock and John C. Blair & Co. of Huntingdon.

At Pittsburgh equity proceedings have been instituted in the courts by Henry S. Mould, individually and as trustee, against the Henry S. Mould Company, asking for a receiver to take charge of the affairs of the company. The bill set forth that the company have a capitalization of \$125,000, operate a plant on Putnam street and have an office in the Empire Building. The plaintiff says he owns one share of stock, and as trustee also owns 100 shares. The company, he says, have assets at cost price of \$60,000, but the same could not be sold at enforced sale for that amount. The liabilities amount to \$68,000, and among the claims is an execution attachment secured by the First National Bank for \$30,000. The court appointed H. M. Allison receiver, requiring bond in the sum of \$10,000 for the present. The concern are manufacturers of briquetting machinery.

Shipbuilding in the Fiscal Year 1903.

Commissioner Chamberlain's Annual Report.

WASHINGTON, D. C., December 29, 1903.—The importance of the early passage by Congress of the pending bill, indorsed by the Administration, providing for a commission to investigate and to report to Congress at its next session what legislation is desirable for the development of the American merchant marine and American commerce, is strongly emphasized by Commissioner of Navigation Chamberlain in his annual report, just submitted to the Secretary of Commerce and Labor. Statistics presented in this report confirm the prediction made by the Commissioner several months ago that the shipyards engaged in the construction of steel vessels would by the end of the current fiscal year be practically reduced to working on Government contracts for war ships and vessels for the coastwise trade, all orders for ocean vessels having been filled. Some interesting figures are given which show that very little is to be hoped for in the way of new contracts growing out of the extension of the coastwise laws to the Philippines on July 1 next; first, because a sufficient number of American vessels are now engaged in the Pacific trade to provide tonnage for all direct shipments; and, second, because a considerable number of vessels heretofore employed in other lines of trade will be available before July 1 for service between the United States and the Philippines, via the Suez Canal.

Documented Vessels Exceed 6,000,000 Tons.

The documented tonnage of the United States on June 30, 1903, for the first time in our history exceeded 6,000,000 gross tons register, comprising 24,425 vessels, of 6,087,345 gross tons. These figures do not include 1828 yachts, of 74,990 gross tons, which, of course, are not engaged in trade. The total shipping of the United Kingdom for 1902 was 20,258 vessels, of 15,357,052 gross tons. The total shipping of the German Empire on January 1, 1902, was 6024 vessels, of 3,503,551 gross tons. The shipping of the United Kingdom and Germany, however, is principally employed in the development of foreign trade, and is of the types required by that trade. The shipping of the United States is almost wholly a part of our domestic transportation system.

During the past fiscal year 1311 vessels, of 436,152 gross tons, were built and documented in the United States, compared with 1491 vessels, of 468,831 gross tons, for the fiscal year 1902. Of the total tonnage constructed in 1903, the output of iron and steel vessels aggregated 280,362 tons, which included vessels in the foreign trade, the coastwise trade and on the Great Lakes.

The recent trade tendencies of American shipbuilding, including effects of legislation enacted or proposed, are shown by the following table of the number and tonnage of ocean steel steamers of 1000 tons or more built and documented during the fiscal years 1901, 1902 and 1903, and building or under contract during the fiscal year 1904, with the trades for which they have been designed.

Trade.	1901.		1902.	
	No.	Gross tons.	No.	Gross tons.
Foreign, transatlantic.....	1	12,760	1	12,760
Foreign, transpacific (direct) ..	2	19,212	2	19,212
Foreign, transpacific (via Hawaii)	3	18,495	1	11,276
Foreign, West Indies, Mexico, Venezuela.....	4	17,121	3	5,353
Coasting (Hawaii).....	4	22,492	2	13,079
Coasting	14	37,134	12	47,025
Totals	25	95,242	21	108,775
Trade.	1903.		1904.	
	No.	Gross tons.	No.	Gross tons.
Foreign, transatlantic.....	4	36,500	1	7,914
Foreign, transpacific (direct) ..	2	42,000	2	42,000
Foreign, transpacific (via Hawaii)	1	11,284	2	27,000
Coasting (Hawaii).....	2	17,286
Coasting	11	36,401	7	31,996
Totals	18	101,471	12	108,910

The figures for the first three years stand for finished work, while those for 1904 represent vessels building or under contract on July 1 last. Of the steamers now under construction, the "Minnesota" of the Great North-

ern Steamship Company, for direct trade with Asia, will probably be in operation during the current year. This steamer is by far the largest vessel ever built in the United States, and with the twin ship "Dakota," to be launched this year, should give the United States an important position in Asiatic trade. The largest British steamer built last year was the "Cedric," of 21,035 gross tons; the largest German steamer, the "Kaiser Wilhelm II," of 19,360 tons. The "Minnesota" measures about 21,000 gross tons. With the completion of these two Great Northern steamers the list of large ocean steamers for foreign trade, which have now been carried for three years on the bureau's tables of vessels under construction or under contract, will be closed. The output of ocean steamers of 1000 tons or over will be less this year than in 1901, 1902 or 1903. The total tonnage built during the quarter ended September 30, 1903, was 310 vessels, of 66,023 gross tons, compared with 348 vessels, of 103,421 gross tons, for the corresponding quarter last year. The steel steamers built during the same quarter of the current fiscal years numbered 23, of 36,609 gross tons, compared with 25, of 65,984 gross tons, for the corresponding quarter last year.

End of a Period of Active Construction.

The fact should not be lost sight of that the construction of steel ocean vessels in the past two or three years has been abnormally large. During the calendar year 1900 the building of ocean steel steamers in the United States was stimulated by legislation growing out of our changed relations to Hawaii, Porto Rico, the Philippines and, to an extent, Cuba; by the recent purchase of American merchant steamers for military purposes, and more particularly by the anticipated passage of the subsidy bill. Shipbuilding in other countries was stimulated by other causes, of which the enormous demand of the British Government on the British merchant marine for army transports was the most notable. These other causes had scarcely an appreciable effect on the shipbuilding industry in the United States. Were it not for the considerations referred to the completion during 1903 of four steamers for transatlantic trade—"Finland," "Maine," "Massachusetts" and "Mississippi" (more in one year than have been built here before in nearly a generation for that trade)—would be a notable event in our history. It is notable as testimony to the skill of our shipbuilders, the excellence of their plants, and to the disposition and resources of our shipowners. It is not evidence of a steady or normal demand, on which our shipbuilders and those identified with them can safely rely for employment hereafter. The only new demand is that for steamers to carry oil in bulk, such as "Col. E. L. Drake," "Ligonier" and "Larimer." The development of the Texas petroleum fields will require the construction of more such vessels for the coasting trade.

The Philippine Trade.

The trade between the United States and the Philippines is now conducted almost entirely in foreign bottoms. During the calendar year 1902, according to the annual review of the Bureau of Insular Affairs, American vessels carried from the United States to the Philippines only \$252,885 of merchandise; foreign vessels, \$3,993,991. From the Philippines to the United States American vessels carried \$146,270 merchandise; foreign vessels, \$11,509,678. American vessels in 1902 thus carried only about 3 per cent. of the merchandise transported in trade between the Philippines and the United States. To confine this trade entirely to American vessels after the first of next July will involve a complete reversal of existing carrying conditions, but by that time, or soon thereafter, American tonnage, steam and sail, will be available to carry practically all the merchandise now moved between ports of the archipelago and of our Pacific Coast.

Under the conditions above set forth it will be seen that in default of some special stimulus such as might result from the passage of a wisely framed shipping bill, the outlook for the development of the American merchant marine and the shipbuilding industry is not particularly encouraging. It is recognized that the subject is one which cannot be thoroughly investigated in a few months, hence the friends of the pending commission bill

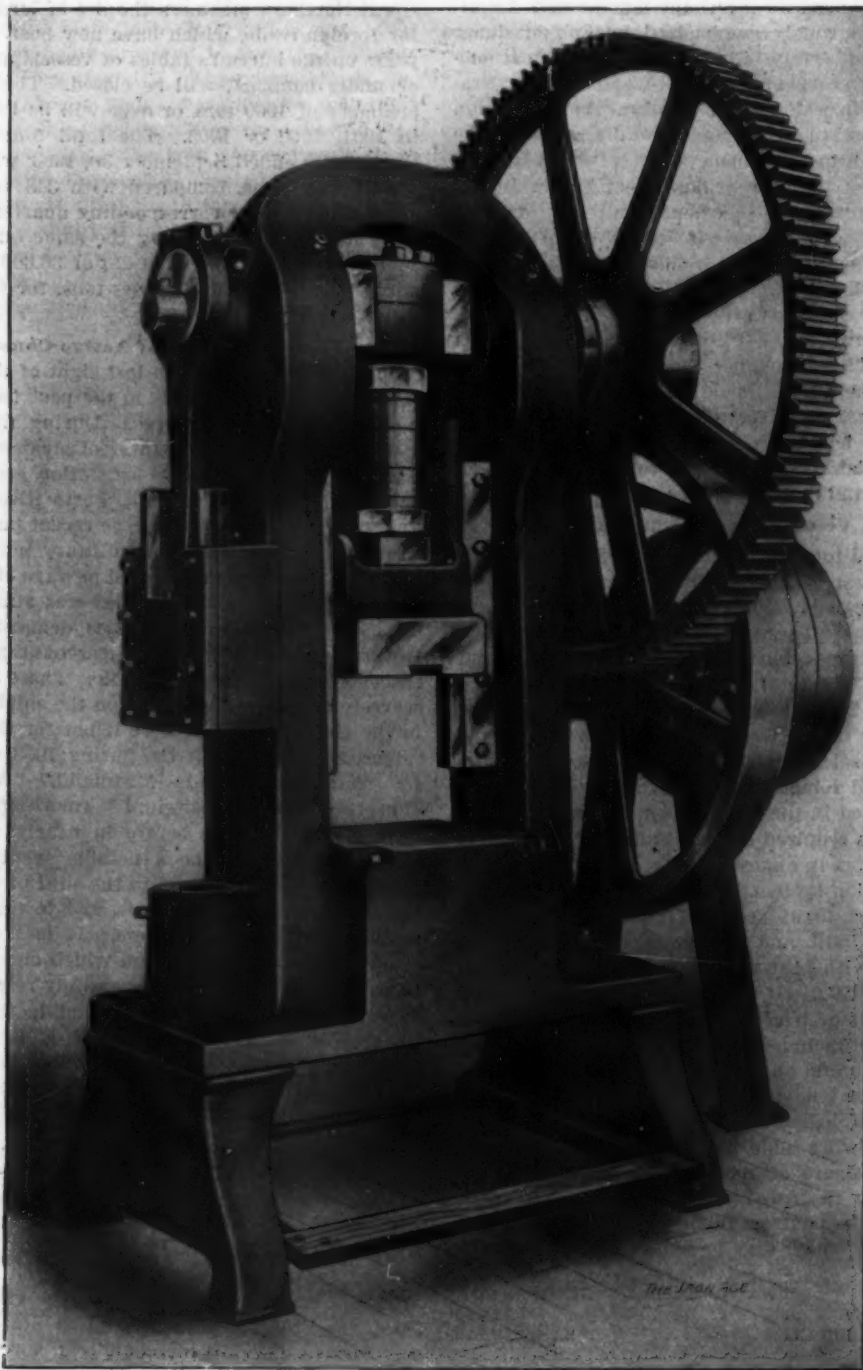
are anxious that it shall be enacted at the earliest practicable moment in order that the commission may be prepared to report upon the convening of Congress in December, 1904.

W. L. C.

A New Design of Bliss Press.

Drop forgings have come into such wide fields of usefulness and the demand for them has been so great

of work and designated by the same trade number. Material alterations from the previous practice in this press are evident from a comparison between the old and the new. The machine is designed particularly for trimming drop forgings, either hot or cold, but is said to be equally well adapted to the work of punching, piercing, shaping or stamping heavy blanks in the manufacture of electrical instruments, sewing machines, typewriters, cash registers, cutlery, hinges, skates, bicycle



NEW DESIGN OF BLISS NO. 75 1/2 PRESS.

during the past few years that machines especially adapted to their manufacture have been accorded particular attention. Rapid and economic production has of course been sought in all branches of the work, and new machines have in many cases been found necessary to satisfy the requirements along this line. Numerous machines of standard design have also been more or less altered, and in some cases entirely redesigned, to secure improvement in efficiency of operation or in adaptability to the special requirements of the work. We illustrate at this time a Bliss straight sided press which represents the results of a complete revision of the makers' former construction of their machine designed for the same class

and automobile parts, and all sorts of sheet metal work of a similar nature.

As seen in the engraving, the whole of the driving mechanism—pulleys, fly wheel and gearing—is placed at one side of the press, whereas in the former design the pulleys and fly wheel were at the opposite side from the gearing. In the older machine a cross shaft, running in bearings attached to the rear sides of the frame uprights, carried the pulleys, fly wheel and pinion. In the new machine this shaft is very short and its outer end is supported by an outboard bearing mounted upon a floor stand. The revised arrangement leaves the front and back of the press quite clear and gives the op-

erator the utmost freedom for handling work conveniently, either before or behind. The driving gears have cut teeth and run very quietly; their ratio is 9 to 1. The shaft is a heavy steel forging, 6 inches in diameter at the crank pin. The clutch mechanism is of the familiar Bliss two-piece automatic pin type. The fly wheel is 62½ inches in diameter and 6 inches across the face, weighing 1600 pounds. The pulleys are 36 x 6 inches and run 260 rotations per minute.

The bed is very heavy, having a thickness of 12 inches. The slides are of unusual width and are of such length as to completely support the head while the dies are in action, thus insuring most nearly perfect work, greatly reducing the wear and materially increasing the life of the tools and machine. The main press has a stroke of 7 inches, while that of the trimming attachment at the left hand side is 3½ inches. The following additional dimensions are given: Horizontal distance between the uprights, 23 inches; between the gibs of the slides, 16½ inches; distance of the head above the bed, with stroke down and adjustment up, 13 inches; distance of the side trimming head above the bed, with stroke down, 11½ inches. The floor space required is measured by a forward and back depth of 5 feet 2 inches and a right and left breadth of 8 feet 11½ inches. Net weight of the complete machine is stated at 17,000 pounds.

The E. W. Bliss Company, Adams and Plymouth streets, Brooklyn, N. Y., are the makers, this press being the new design of their No. 75½ machine.

The Champion Post Drill.

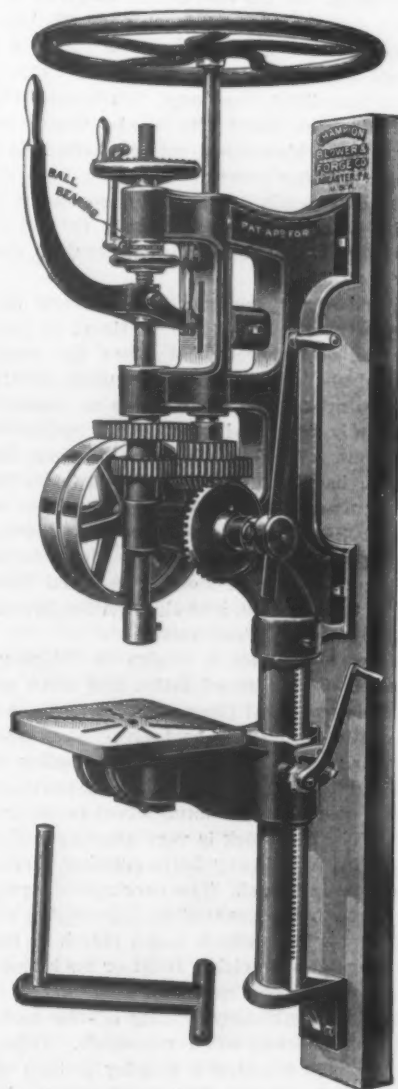
Both lever feed and automatic self feed are here provided in a post drill, arranged for driving by either hand or power. This combination of features is one believed to be unique in tools of this class, affording the possessor of the machine a hand drill or a hand and power drill equipped with all the feeding devices found upon a modern drilling machine of the more elaborate types.

The automatic self feed is actuated by a ratchet and pawl rotating the hand wheel shown just below the fly wheel in the illustration. The lever feed is of the simplest form, the lever being counterweighted for practically perfect balance. The hand and automatic feeds are quite independent of each other, and when either is in use change may be made to the other almost instantly. This feature is held to be of material value as contributing to the versatility of the machine and its adaptability to a wide range of work.

Quick return of the drill bit out of the hole which it has bored is claimed to enable a very large saving of time and labor in the operation of the machine, as compared to other hand tools of this class, in which the feed screw must be reversed for backing up the drill. Two spindle speeds are provided for by the double train of spur gears by which the spindle is driven from the vertical fly wheel shaft. Power is received by belt at the tight and loose pulleys, while hand operation is provided for by the crank handle at the opposite end of the same shaft. This crank is adjustable in length to enable the operator to secure the most advantageous radius under the conditions of a given case. The fly wheel shaft is driven from the pulley and crank shaft by bevel gears. The table is adjustable in height, elevation and lowering being controlled by a rack and pinion operated by a hand crank and locked by a ratchet and pawl.

Thrust of the spindle is carried by a ball bearing. All gearing is of cast iron, the teeth cut from the solid. The usual speed of the pulley shaft when the machine is power driven is intended to be 180 rotations per minute. The distance from the center line of the spindle to the table supporting column is 10½ inches, so the machine will drill to the middle of 21 inches. The vertical travel of the drill is 5½ inches. The largest size of drill for which the tool is designed is 1½ inches. The Champion drill is intended not alone for such work as

rapid boring of small holes, reaming and countersinking in metals, but also for conveniently serving the wood worker in many cases of boring in the materials with



THE CHAMPION POST DRILL.

which he deals. The makers are the Champion Blower & Forge Company, Lancaster, Pa.

The New York *Commercial Advertiser* for December 19 contains an interesting account of the discovery of a great placer deposit of tin ore in the Nome district, Alaska, which was made by Miss E. R. Steiner of New York, an artist, musician, explorer and traveler. In the fall of 1902 she brought a quantity of the ore to New York and interested capital in developing the deposit, forming the York-Alaskan Tin Corporation, organized under the laws of Maine with a capital of \$1,000,000. The deposit is said to be located 130 miles northwest of Nome in the right fork of the Buck Creek. The stockholders in the corporation are engaged in the wholesale drug trade, and the statement is made that the stock is not offered for sale. The president is Charles Roome Parmele, 45 John street.

Sanveur & Whiting, metallurgical engineers, of Boston, Mass., have arranged to give an elementary course of 14 lessons by correspondence, embracing the micro-structure of iron and steel, the thermal critical points of steel and the influence of wind and heat treatment on structure.

The opening of the Simplon tunnel is to be celebrated by an international exhibition at Milan, in 1905, bearing chiefly on transportation.

American Tests of Rapid Cutting Tool Steels.

The recent report of Dr. J. T. Nicholson on experiments with rapid cutting tool steels, as given by abstract in *The Iron Age* for November 26, page 28, has afforded much valuable data and information on this very important and highly interesting subject. The Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, were among the first to adopt the Taylor-White process of treating steels for high speed cutting tools, and have followed it up by trying nearly every other high speed steel as offered. Frequently quite an improvement would be noted and a quantity purchased, only to find something later apparently much better. The subject thereby became very complex.

High speed steels are now so numerous that it has become necessary to select one of them, if possible, for universal use, and thereby cut down the great variety now scattered about the shops, preventing maintenance of the maximum speeds for all tools, as no standard speeds can be definitely fixed and successfully maintained under such conditions. While testing one of their high speed lathes, which has been designed to meet the new conditions and requirements brought about by these new steels, the Lodge & Shipley Company have conducted several series of experiments to determine the relative values of the several high speed steels, the speed limits which it is possible to maintain, and the relative breaking down point of each grade of steel tested.

The lathe used was a Lodge & Shipley 20-inch, equipped with a high speed lathe, tail stock and double tool rest, as described at page 16 of *The Iron Age* for November 19. The spindle is exclusively gear driven, with two changes of speed, the ratios from pulley to spindle being 3 : 1 and 9 : 1. The changes are instantly secured by sliding gears operated by a hand wheel in the front of the head stock. The tail stock is very massive and held down to the shear by four heavy bolts running through to the top of the spindle barrel. The carriage is equipped with two plain rests, both operated by telescoping screws and the same hand wheel, which has a clutch in each end of the hub to engage with either front or back rest screw, as may be desired. The front tool rest has a transverse adjustment to permit easy setting of the tools and the dividing up of the cut when necessary. Otherwise the lathe as used was a Lodge & Shipley 20-inch swing with their well-known change gear mechanism. The power was derived through a 6-inch belt from a No. 3 Chard variator mounted on the ceiling and belted from the line shaft. This variator gives eight changes of speed, secured instantly and without stopping the lathe. With the constant speed shaft running at 235 rotations per minute there was secured at the variable shaft of the variator 637, 506, 376, 272, 200, 146, 108 and 85 rotations per minute.

In Fig. 1 are diagrammatically depicted the surface speeds obtainable. Read the surface speeds in feet per minute at the left of the diagram and the diameters in inches at the bottom. The diagonals represent the speeds secured in rotations per minute. To illustrate, with No. 1 variator speed and the rapid gear speed of head stock engaged, 283 rotations per minute are secured at the spindle, represented by the first diagonal at the left, labeled 283 F-1. "F" refers to the fast speed of the head stock and "S" to the slow speed; the numeral following is the number of variator speed, ranging from the highest to the lowest. The intersection of the vertical line representing the diameter with the diagonal line representing the rotations per minute gives the surface speed at the left. Likewise, the speed most available for a given diameter and surface speed can be found at the intersection of the lines for diameter and surface speed, selecting the nearest speed found either above or below the surface speed desired if it does not fall on the intersection.

For tools were selected seven brands of the well-known high speed steels, labeled A, B, C, D, E, F and G, respectively. Several tools of each steel were made, all of the same size, shape and angles. These were then numbered consecutively, thus: A-1, A-2, A-3, A-4, B-5, C-6, C-7, D-8, D-9, E-10, F-11, F-12 and G-13. They are so referred to in the tables and reports.

The limit tests shown in Table I were made with a 5/8-inch diameter bar of machine steel, taken from stock, and contained about 0.18 per cent. carbon. Preliminary tests were made, while removing the scale on this bar, to determine in about what order the tools might stand, so as to give the better ones the higher speeds in the final tests. Cuts of 1/4-inch reduction or 1/8-inch depth by 1-20-inch feed were then made, the results of tests Nos. 129 to 136 being shown in Table I. Here tool No. A-2 is shown with the highest surface speed, and in spite of this handicap leads all the others in duration of cut, while of the others B-5

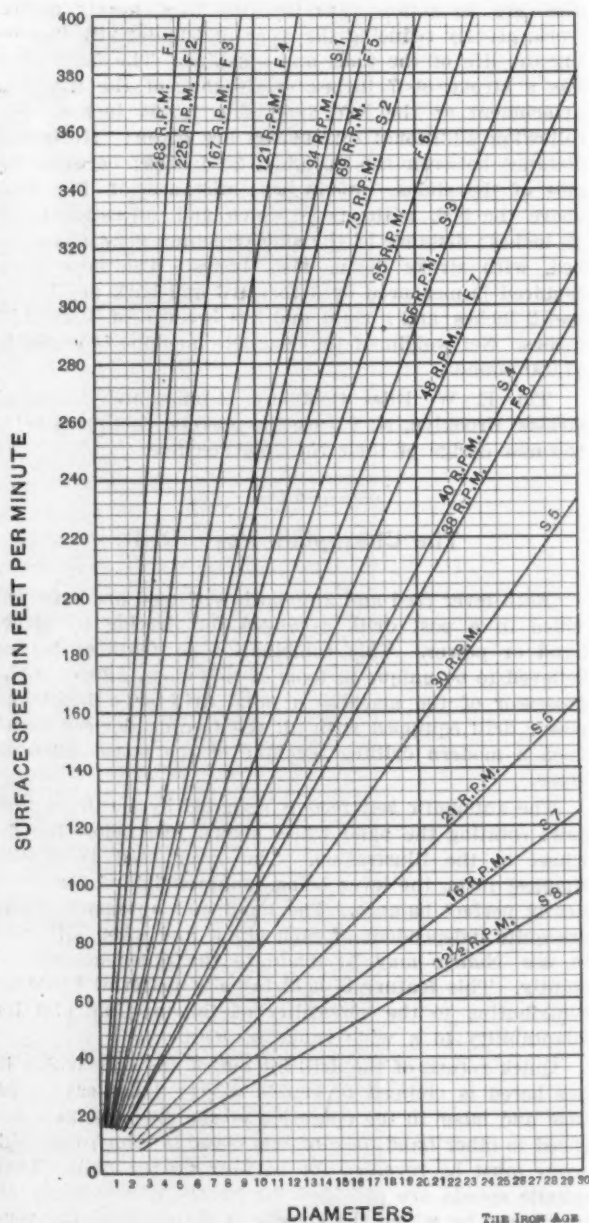


Fig. 1.—Diagram of Diameters and Speeds.

AMERICAN TESTS OF RAPID CUTTING TOOL STEELS.

and E-10 made the best showing. The bar was then turned around and light cut tests were made with 1-40-inch feed and 1-32-inch depth of cut—tests Nos. 154 to 179, illustrated in Table I. Speeds as high as 361 feet per minute were obtained in test No. 154, at which A-2 tool stood up to a total longitudinal feed of 25 inches—far in the lead of all the other tools. Here again B-5 and E-10 lead the others, with G-13 making a fair showing.

Tests on cast iron were then made, using a casting 8 inches in diameter and 12 inches long, as clean of sand as could be secured, and about of medium grade iron. After removing the scale the light cut tests were run, as shown in Table II, Nos. 191 to 199, with 1-20-inch feed and 1-16-inch depth of cut, at 184 feet surface speed. Here some of the tools broke down instantly, and most

of the others made but little better showing. Tool A-2 was the only one to run across the casting, with B-5 leading the rest. With a medium cut, 1-10-inch feed, $\frac{1}{8}$ -inch depth and about 119 feet surface speed, most of the tools made a little better showing, the C, D and E tools, however, breaking down more quickly than at the lighter cut and higher speed. Here again A-2 tool made a record showing, running $1\frac{1}{2}$ times across the casting with a total

Table I.—Material: Medium Machine Steel.—Dry Cut.

Test number.	Tool number.	Cutting speed.—Feet per minute.	Duration of cut. Min. Sec.	Total longitudinal feed of tool. Inches.	Condition of tool at finish.
Feed, $\frac{1}{32}$ inch. Cut, $\frac{1}{32}$ inch. Stock diameter, about 5 inches.					
154.....	A-2	361	3 32	25	Limit.
163.....	B-5	337	51	6	Limit.
167.....	C-6	328	30	$3\frac{1}{2}$	Limit.
168.....	D-8	326	15	$1\frac{1}{2}$	Limit.
170.....	G-13	319	55	$6\frac{1}{2}$	Limit.
173.....	E-10	305	2 32	18	Limit.
178.....	F-11	296	04	$\frac{1}{2}$	Limit.
179.....	F-12	296	06	1	Limit.
Feed, $\frac{1}{32}$ inch. Cut, $\frac{1}{8}$ inch. Stock diameter, about 4 $\frac{1}{2}$ inches.					
129.....	A-2	201	1 49	$14\frac{1}{2}$	Still good.
130.....	C-6	191	23	$3\frac{1}{2}$	Limit.
131.....	C-7	191	11	$1\frac{1}{2}$	Limit.
132.....	D-9	191	36	5	Limit.
133.....	D-8	191	22	3	Limit.
134.....	B-5	186	32	$4\frac{1}{2}$	Limit.
136.....	E-10	180	43	6	Limit.

of 15 inches longitudinal feed to its credit without breaking down. B-5 again made the best showing of the rest, with two other tools of "A" brand falling in the rear, but still leading all the others. The results of these tests show that brand "A" of air hardening steel tempered at a high heat in oil is far superior to all the others we have tested. All of these tests were run dry.

These tests were then supplemented by several for endurance, using the two brands of steel showing the best records in the limit tests. We selected 25 back gear sleeve forgings made from machine steel of about 0.18 per cent. carbon, rough forged, with an allowance of $\frac{1}{4}$ inch in diameter for finish on the small diameter and $\frac{3}{8}$ inch for the large diameter. These forgings were unpickled, being centered and faced to length only before the operations

Table II.—Material: Medium Cast Iron.—Dry Cut.

Test number.	Tool number.	Cutting speed.—Feet per minute.	Duration of cut. Min. Sec.	Total longitudinal feed of tool. Inches.	Condition of tool at finish.
Feed, $\frac{1}{32}$ inch. Cut, $\frac{1}{32}$ inch. Stock diameter, about 7 $\frac{1}{2}$ inches.					
191.....	A-2	187	2 20	11	Limit.
193.....	D-8	184	13	1	Limit.
194.....	F-12	184	03	$\frac{1}{4}$	Limit.
195.....	C-6	184	13	1	Limit.
196.....	D-9	184	13	1	Limit.
197.....	E-10	184	13	1	Limit.
198.....	G-13	184	13	1	Limit.
199.....	B-5	184	32	$2\frac{1}{2}$	Limit.
Feed, $\frac{1}{32}$ inch. Cut, $\frac{1}{8}$ inch. Stock diameter, about 7 inches.					
212.....	C-7	119	02	$\frac{1}{4}$	Limit.
213.....	D-9	119	02	$\frac{1}{4}$	Limit.
214.....	B-5	119	46	5	Limit.
215.....	E-10	119	02	$\frac{1}{4}$	Limit.
216.....	A-1	119	27	3	Limit.
218.....	A-3	114	18	2	Limit.
219.....	A-2	114	2 18	15	Limit.
Feed, $\frac{1}{32}$ inch. Cut: No. 221, $\frac{3}{8}$ inch; No. 222, $\frac{1}{4}$ inch.					
221.....	A-2	106	2 46	9	Still good.
222.....	A-2	94	2 46	9	Still good.

recorded herewith. As the larger diameter was not always forged true to the smaller diameter of the forging, there was here a very irregular cut of from $\frac{1}{8}$ to $\frac{1}{4}$ inch depth, but averaging about 3-16 inch. These forgings were rough finished to $2\frac{1}{2}$ and $4\frac{1}{2}$ inches diameters, Fig. 3, leaving only sufficient for grinder finishing. The record of this series of tests, which were run wet, is shown in Table III, where Nos. 223 to 237 tests show that two tools were used, one in each rest, the back tool removing

only sufficient to keep under the skin of the forging most of the time. Both tools required regrinding after finishing eight forgings at a total of 152 inches longitudinal feed of tool at a surface speed of 169 feet. After regrinding the tools, seven pieces were finished when the back

Table III.—Material: Machine Steel Forgings (Lathe Back Gear Sleeves).—Wet Cut.

Tests numbers.	Tools used.	Tool numbers.	Number of pieces turned.	Condition of tools at finish.
Feed, $\frac{1}{32}$ inch. Cut, $\frac{1}{8}$ inch. Cutting speed, 169 feet per minute. Duration of cut, 1 minute 40 seconds. Total longitudinal feed, 19 inches.				
223-230....	2	A-2 A-4	8	Both required regrinding.
231-237....	2	A-2 A-4	7	Back one required regrinding.
238-246....	1	A-2	9	Still in good condition.
247.....	1	B-2	$\frac{1}{4}$	Limit.
Feed, $\frac{1}{32}$ inch. Cut, $\frac{1}{8}$ to $\frac{1}{4}$ inch. Cutting speed, 155 feet per minute. Duration of cut, 1 minute. Total longitudinal feed, 3 inches.				
248-261....	1	A-1	14	Required regrinding.
262-272....	1	A-3	11	Still in good condition.

tool broke down, the front tool, however, being still in a very fair condition. A single tool, A-2, was then tried. This finished nine pieces, or one more than the full run of the double tools, and the tool was found to be still good for further use. The condition of the tool being somewhat interesting, a photograph of it is reproduced in Fig. 2. The friction of the chip curling from the tool has worn a concave spot $\frac{1}{4}$ inch in diameter and 0.025 inch

Table IV.—Material: Bar Machine Steel.—Wet Cut.

Tests numbers.	Tools used.	Tool numbers.	Number of pieces turned.	Condition of tools at finish.
Feed, $\frac{1}{32}$ inch. Cut, $\frac{3}{8}$ inch. Cutting speed, 167 feet per minute. Duration of cut, 2 minutes 10 seconds. Total longitudinal feed, $7\frac{1}{2}$ inches.				
275-290....	2	A	16	Both required regrinding.
291-307....	2	A	16	Both required regrinding.

deep on top of the point, while there is no evidence of wear on the cutting edge. The superior endurance of the single tool over the double was attributed to hard spots in the forging, as in later tests on bar stock a saving was demonstrated by the use of two tools to divide up a

Table V.—Material: Machine Steel Forgings (Lathe Back Gear Sleeves).—Wet Cut.

Test No.	Feed. Inches.	Cut. Inches.	Speed per minute.	Duration of cut. Min. Sec.	Total longitudinal feed. Inches.	Horse-power. Total.	Cut only.
87.....	2-15	1-16	175	50	21	17	..
88.....	2-15	1-16	175	50	21	19	..
89.....	2-15	1-16	175	50	21	13.6	..
90.....	1-5	1-16	175	40	21	15.9	..
99.....	1-10	1-16	121	1 28	21	7.2	..
100.....	1-10	1-16	121	1 28	21	7.7	..
101.....	1-10	1-16	121	1 28	21	7.1	..
102.....	1-10	1-16	121	1 28	21	9	..
103.....	1-10	1-16	121	1 28	21	9	..
104.....	1-10	1-16	121	1 28	21	7.7	..
105.....	1-10	1-16	121	1 28	21	8	..
106.....	1-10	1-16	121	1 28	21	7.2	..
108.....	1-30	$\frac{1}{2}$	108	..	24	..	15
109.....	1-22	$\frac{3}{4}$	128	..	24	..	17
110.....	1-20	$\frac{1}{2}$	128	..	24	..	19
111.....	1-20	$\frac{1}{2}$	160	..	24	..	30+
112.....	1-20	$\frac{1}{2}$	92	..	24	..	22.5
113.....	1-10	$\frac{3}{4}$	66	..	6	15.4	..
114.....	1-80	1-32	342	1 40	7	3.4	..
116.....	1-40	1-16	340	..	11	5.4	..

heavy cut. Test No. 247 was then made with B-5 tool, but the tool failed before the full length of the forging was covered. The large diameter was then machined with the same feed, but with about 155 feet surface speed, using A-1 tool, which stood up to finish 14 pieces before regrinding. No. A-3 tool was then used to finish the remaining 11 forgings, leaving it in very fair condition at the finish.

In Table IV a subsequent run on the rough turning of 16 shafts from $2\frac{1}{4}$ -inch machine steel is recorded, the

ends being reduced to $1\frac{1}{2}$ inches diameter by $7\frac{3}{4}$ inches long and 1 13-16 inches diameter by 14 inches long in one cut, respectively. This was done with two tools of brand "A" steel, oil hardened, placing one tool in each rest and dividing the cut equally between them. Sixteen shafts were rough turned to the dimensions given without removing the tools from the rest, and they still re-

able to say how much over 30 horse-power was consumed in the cut. However, at times the hand vibrated back of the pin slightly, so that a reading could be taken. Nos. 87 to 106 were made upon a lot of back gear sleeve forgings similar to but larger than those used in tests shown in Table III. In tests Nos. 99 to 106 were recorded the total time of turning and handling, in which the lathe

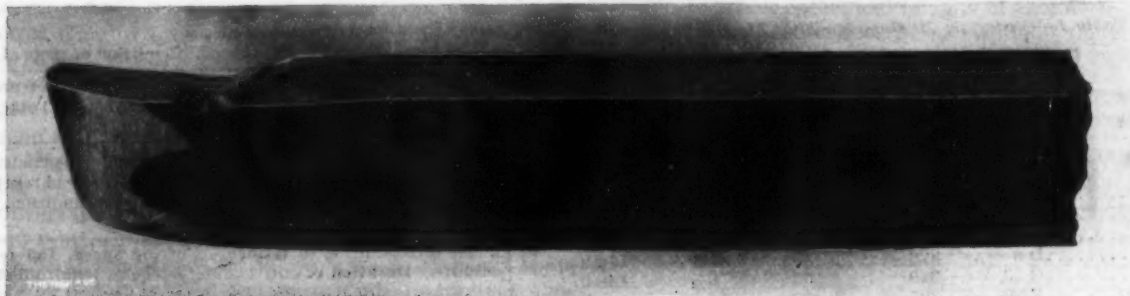


Fig. 2.—Condition of a No. A-2 Tool After Finishing Nine Back Gear Sleeves.

AMERICAN TESTS OF RAPID CUTTING TOOL STEELS.

remained in a condition suitable for further service without grinding.

Previous to the experiments already recorded several tests were made with the same lathe driven by motor through the same variator, but at a higher speed, the constant speed shaft of the variator running at about 285 rotations per minute. We secured voltmeter and ammeter readings during these tests, from which readings the horse-powers of cuts taken were calculated. In Table

operator, unassisted, rough turned the long end of eight forgings in 24 minutes, or at the rate of 200 in ten hours. It is doubtful whether he could have maintained this rate all day, however. The tool used was of the "A" brand, oil hardened, and was in very good condition at the close of the experiment.

Fig. 3 shows the forgings as rough finished by experiments Nos. 87, &c., and Nos. 223 to 247. The larger pile contains 30 pieces, rough turned on the long end only,

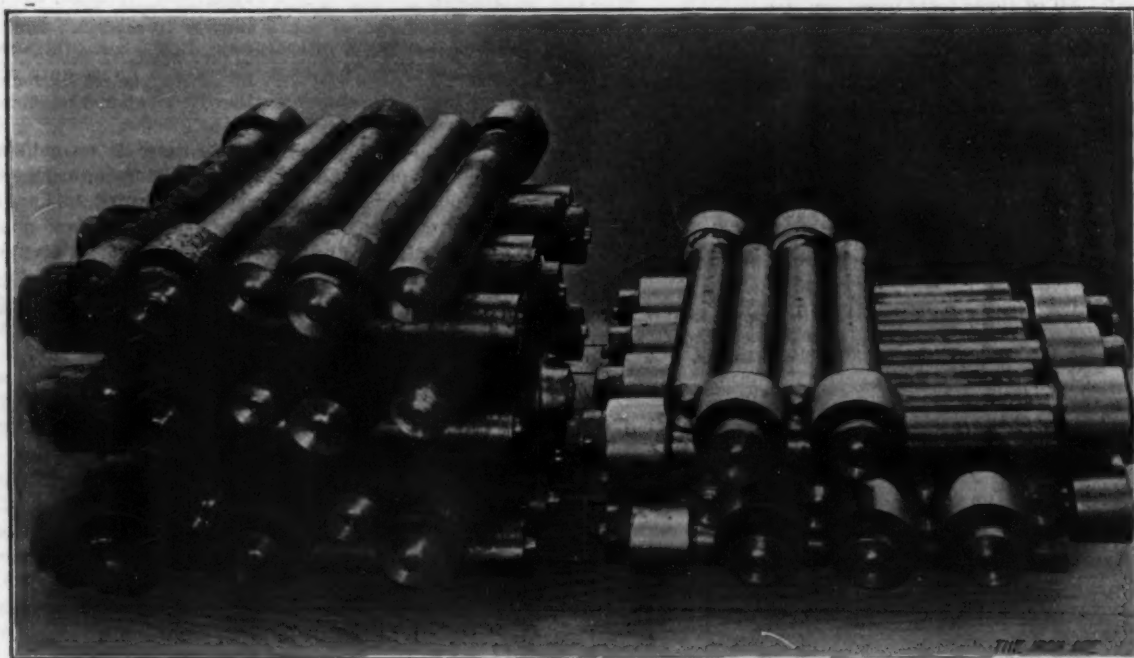


Fig. 3.—Back Gear Sleeves Rough Turned by the Tools Tested.

AMERICAN TESTS OF RAPID CUTTING TOOL STEELS.

V tests Nos. 87 to 106 and 113 to 116 show the horse-power consumed by lathe, variator and cut, while Nos. 108 to 112 give the horse-power of cut only. It was quite clearly demonstrated during these tests that at the higher speeds much more power was consumed to remove a given amount of metal than at the slower speeds; also that the angle of the tool made quite a difference, as is illustrated by tests Nos. 87, 88 and 89, each being under the same conditions, except that the angle of the top of the tool was changed in each case. In test No. 111, 1-20 inch feed and $\frac{1}{2}$ -inch depth of cut at 160 feet surface speed, the ammeter reached the limit, and we were un-

able to say how much over 30 horse-power was consumed in the cut. However, at times the hand vibrated back of the pin slightly, so that a reading could be taken. Nos. 87 to 106 were made upon a lot of back gear sleeve forgings similar to but larger than those used in tests shown in Table III. In tests Nos. 99 to 106 were recorded the total time of turning and handling, in which the lathe

operator, unassisted, rough turned the long end of eight forgings in 24 minutes, or at the rate of 200 in ten hours. It is doubtful whether he could have maintained this rate all day, however. The tool used was of the "A" brand, oil hardened, and was in very good condition at the close of the experiment.

Fig. 3 shows the forgings as rough finished by experiments Nos. 87, &c., and Nos. 223 to 247. The larger pile contains 30 pieces, rough turned on the long end only,

Summing up the results of these tests, it would appear that with the brand of steel marked "A," oil hardened, it is feasible to maintain much higher speeds than the deductions from Dr. Nicholson's experiments would

imply, and in many cases these conclusions are being lived up to in the everyday shop practice of the Lodge & Shipley Machine Tool Company.

Railway Construction in 1903.

During the early months of 1903 railway building in the United States had attained such an impetus as to make it apparent that the close of the year would show a new mileage 1000 miles in excess of the construction for the year 1902. But soon after our article on "Railway Building in Progress" was published on March 20, which showed 8500 miles under contract, labor became threatening and an epidemic of strikes and demands for increase in wages—demands which in many cases were unreasonable—followed. This caused railway managers to call a temporary halt in improvements which required the expenditure of vast sums of money. Later clouds appeared on the financial horizon and the apprehension caused thereby was responsible for the suspension of much important work which was well under way. The upheaval in Wall Street did not affect the real value of railway securities, for the country at large was prosperous almost to a degree never experienced before, and the roads had all the traffic they could handle. But when a railroad company are contemplating an issue of bonds to provide funds for improvements they have to go to Wall Street, and it was wisdom on the part of those responsible for the management of our railroads to hold up improvements calling for bond issues until the financial skies should clear.

For these reasons latterly it has been anticipated that the close of the year would show a smaller new mileage than was completed in 1902. The figures for the first six months of the year were less than those for the corresponding period of 1902, which tended to confirm the prediction that the total for the year would be correspondingly small. Therefore, it is gratifying to note that such premonitions were erroneous. While it is true that the stringency in the money market tied up a large amount of important work, the new mileage for 1903 shows an excess over that completed in 1902. With returns still incomplete, official reports show an aggregate of 5723 miles of track laid from January 1 to December 31, 1903, on 380 lines in 43 States and Territories, including Alaska, where 10 miles of road have been built by one company. This is 175 miles more than shown in the preliminary statement for 1902, and 39 miles more than in the final statement for that year. The detailed figures are given in the following table:

Track Laid from January 1 to December 31, 1903.

States.	Number lines.	Miles.	States.	Number lines.	Miles.
Alabama	14	116.83	Montana	2	71
Alaska	1	10	Nevada	1	36
Arizona	7	117.52	New Jersey.....	1	1
Arkansas	15	203.59	New Mexico.....	6	192.77
California	11	167.49	New York.....	6	45.10
Colorado	5	42.80	North Carolina..	8	109.60
Florida	9	116.77	North Dakota...	5	129.76
Georgia	11	140.50	Ohio	10	133.69
Idaho	2	16	Oklahoma	13	653.32
Illinois	13	171.39	Oregon	7	30.15
Indiana	9	58.02	Pennsylvania ...	29	221.11
Indian Territory..	14	319.12	South Carolina...	4	27.68
Iowa	4	211.59	South Dakota...	1	15.56
Kansas	3	24.25	Tennessee	6	102.48
Kentucky	12	80.48	Texas	21	370.98
Louisiana	17	446.55	Utah	5	120.52
Maine	2	18	Virginia	7	37.92
Massachusetts ...	1	5	Washington	12	116.13
Michigan	21	161.98	West Virginia...	21	148.20
Minnesota	12	189.80	Wisconsin	9	82.73
Mississippi	11	147.40	Wyoming	1	3
Missouri	11	249.67			
Total in 43 States and Territories.....			380	5,723.45	

These figures cover only first track and do not include the many hundreds of miles of second track and sidings built, nor do they take into consideration the reconstruction work, which has proceeded on such an extensive scale throughout the entire country. The latter is a work which perhaps has involved the expenditure of more money than the building of new lines.—*The Railway Age.*

The Alabama Consolidated Coal & Iron Company.

The fourth annual report of the Alabama Consolidated Coal & Iron Company for the fiscal year ending October 31 has just been issued, T. G. Bush, the president, summarizing the results of another year of his administration. The Ironaton furnaces of the company, in spite of some interruptions, produced 70,108 tons, as against 61,244 tons during the preceding year. The furnaces have been improved by new engines and boilers and are now on a basis of 85,000 tons per annum, allowing 30 days for repairs. The new Gadsden furnace was blown in on June 23, 1903, and has a capacity of 75,000 tons per annum. During the year the coal mines produced 518,623 tons, as compared with 475,166 tons during the preceding year. The mines are now equipped so that they can be brought to an output of 650,000 tons a year without material additional improvements. The product of coke was 207,803 tons, as against 200,597 tons, no benefit being received from 100 new ovens constructed at the Lewisburg mines. They bring the equipment up to 765 ovens, with a yearly capacity of 250,000 to 275,000 tons of coke. The output of the red ore mines has been increased nearly 50 per cent.

The income account shows the following:

Income Account for the Year Ending October 31, 1903.

Gross earnings—	
Iron sales.....	\$1,337,451.15
Coke sales.....	720,550.35
Coal sales.....	568,654.18
Store sales.....	474,491.00
Rents collected.....	50,921.52
Saw mills.....	16,416.38
Miscellaneous	11,848.00
Total.....	\$3,180,332.58
Less operating expenses, taxes and other expenses.....	2,566,913.76
Net profits.....	\$613,418.82

The balance sheet shows the following:

Condensed Statement of Assets and Liabilities, October 31, 1903

ASSETS.	
Property account.....	\$4,711,231.49
Improvements	1,519,646.56
Materials and supplies on hand.....	90,669.03
Iron on hand.....	164,789.25
Merchandise in stores.....	67,613.35
Insurance	4,772.20
Accounts and bills receivable.....	149,392.33
Office fixtures.....	2,169.44
Bond expense to be paid yearly.....	9,625.00
Cash	8,236.12
Sinking fund.....	10,000.00
Total.....	\$6,738,144.77

LIABILITIES.	
Capital stock, preferred.....	\$2,500,000.00
Capital stock, common.....	2,500,000.00
Taxes accrued.....	11,037.10
Accounts and bills payable.....	327,477.31
Bonds	490,000.00
Reserved for prospective repairs.....	29,790.45
Depreciation	59,752.17
Royalty	74,236.65
Real estate sales.....	54,575.73
Profit and loss.....	691,275.36
Total.....	\$6,738,144.77

There were paid four dividends, each of \$43,750, on the preferred stock, and one dividend of \$24,980. There was charged for depreciation \$54,000 and for depreciation of iron on hand \$44,106.56.

Mr. Bush, in discussing the market conditions, remarks: "It is the policy of the directors to continue the operation of the furnaces, endeavoring to produce iron at the lowest possible cost; but they will, of course, be guided in their action by future developments and conditions. It is fair and reasonable to say, however, that the properties of this company are in a condition for them to avail themselves of all favorable opportunities that may be presented to the extent of having their mines and furnaces in a first-class physical condition."

The Sharon Steel Hoop Company, Sharon, Pa., have announced a reduction in the wages of their employees. The cut will average 10 per cent., but only those whose wages are not governed by the amalgamated scale are affected.

A Novel Engineering Feat.

The Lowering of a 1000-Ton Drawbridge a Distance of More Than Ten Feet by Means of Floating Sand Jacks.

In their work of elevating and depressing the tracks of their Morris & Essex Division, the Lackawanna Railroad encountered a rather perplexing problem at the point where the road crosses the Passaic River, between Harrison and Newark, N. J. In solving it the chief engineer of the road, Lincoln Bush, introduced a method which is, to say the least, novel and interesting, and which, due to its complete success, forms a valuable addition to the records of engineering performances.

The problem was to remove the double decked draw

which has just been completed, the present draw was substituted for the old one. It was placed on the old pier, the lower tracks only being used. The new draw was used in connection with the old crossing in this manner for more than two years. In the meantime work on new approaches and a new pivot pier progressed at a point 35 feet north of the old bridge.

The new bridge crosses the river at an entirely different grade from the old, and the upper deck of tracks is used for the regular service, while the lower tracks are for the hauling of freight from the yards in Harrison to the freight house and yard on the Newark side of the river. So as to bring the draw down to its proper position in relation to the new approaches and pier it was necessary to lower it about 10½ feet.

To carry out this design four scows 108 feet long, 31½ feet beam and 9½ feet deep were used. They were se-



Fig. 1.—Lowering the Structure.

A NOVEL ENGINEERING FEAT.

span, 220 feet long and weighing 1017 tons, from its piers to the pivot pier provided for it in the new elevation work, 35 feet further up the river, lowering it 10½ feet, so that its upper deck would be at grade with the passenger tracks of the new elevated structure.

To accomplish this the ordinary pontoon principle, aided by the tide, was employed in raising the structure free from its piers and floating it up stream to the new pivot pier. The feat of lowering the immense mass of metal to its new resting place, however, called for the employment of a device entirely new in modern engineering. The draw, when lifted from its position, rested upon wooden plungers which were sustained by dry sand confined within timber boxes. When it was desired to depress its level the sand was allowed to run out of the bottom of the boxes, and the span gradually sank until it rested upon its new pier.

Almost three years ago, when the engineers were preparing for the changing of the gradients of the road, it was found necessary to immediately replace the drawbridge spanning the Passaic River. In order that it might be utilized in connection with the track elevation

curely lashed together in pairs by means of shear blocks and tie rods placed at the top and bottom of the scows, and after having been strengthened wherever necessary in order to meet the special requirements, had their decks built up perfectly level. Extending across the center of each pair of scows a set of sand boxes were constructed. One of these is illustrated in Fig. 2, and the details of construction are given in Figs. 3, 5 and 6. The inside dimensions of each of these boxes were 54 feet long, 4 feet wide and 11 feet high. They were braced diagonally every 5 feet of their length upon the scows with 12 x 12 inch timbers, so that the full weight would be equally distributed on the scows. Each pair of boxes was also tied in the center by means of four rows of horizontal timbers. The plungers, which were built up of 11½ x 11½ inch timbers, and sheathed with ¾-inch matched flooring, were fastened together by means of heavy struts and tie rods, the latter being provided with turnbuckles. These were for holding the plungers perfectly parallel before the weight of the bridge was placed upon them, and to prevent distortion in picking up the load. To hold the plungers perfectly true to the sand boxes, into which

they were to telescope, an additional pair of steel tie rods were run from the tops of the plungers to the tops of the sand boxes. All of these bracings were made so that they could be easily removed as the plungers sank into the boxes.

The sand boxes were filled with dry sand by means of sheet iron ducts running from cars at the end of one of the elevated approaches. In Fig. 2 these ducts are shown, as the filling operation was in progress when the photograph was made. About 80 cubic yards of sand was contained in each box, filling it to within 7 inches of the top.

The plungers were then placed upon the sand, being telescoped into the boxes 7 inches, and the tie rods connecting the plungers and the boxes were secured.

Timbers were secured to the under side of the lower chords of the bridge to furnish a level under surface.

far as 3 feet below. It was also found that many high tides did not rise above the mean, and that many rose as high as 4 feet above it. From these observations it will be noticed that the minimum variation between high and low tide is zero and the maximum 7 feet.

To get the scows with their high superstructure under the draw at low tide, and to prevent a failure in carrying out the work, it was absolutely necessary that they be so arranged that the distance from the top of the bearing points upon them to the water line should be such as to allow the boats to be placed under the span at the highest low tide. At the same time proper provision had to be made for lifting the span from its bearings in case the low tide was a normal one. It was also quite as necessary for the success of the plan for the work to be so arranged that when the span was landed on the new pivot pier at low tide the scows could be released from underneath the

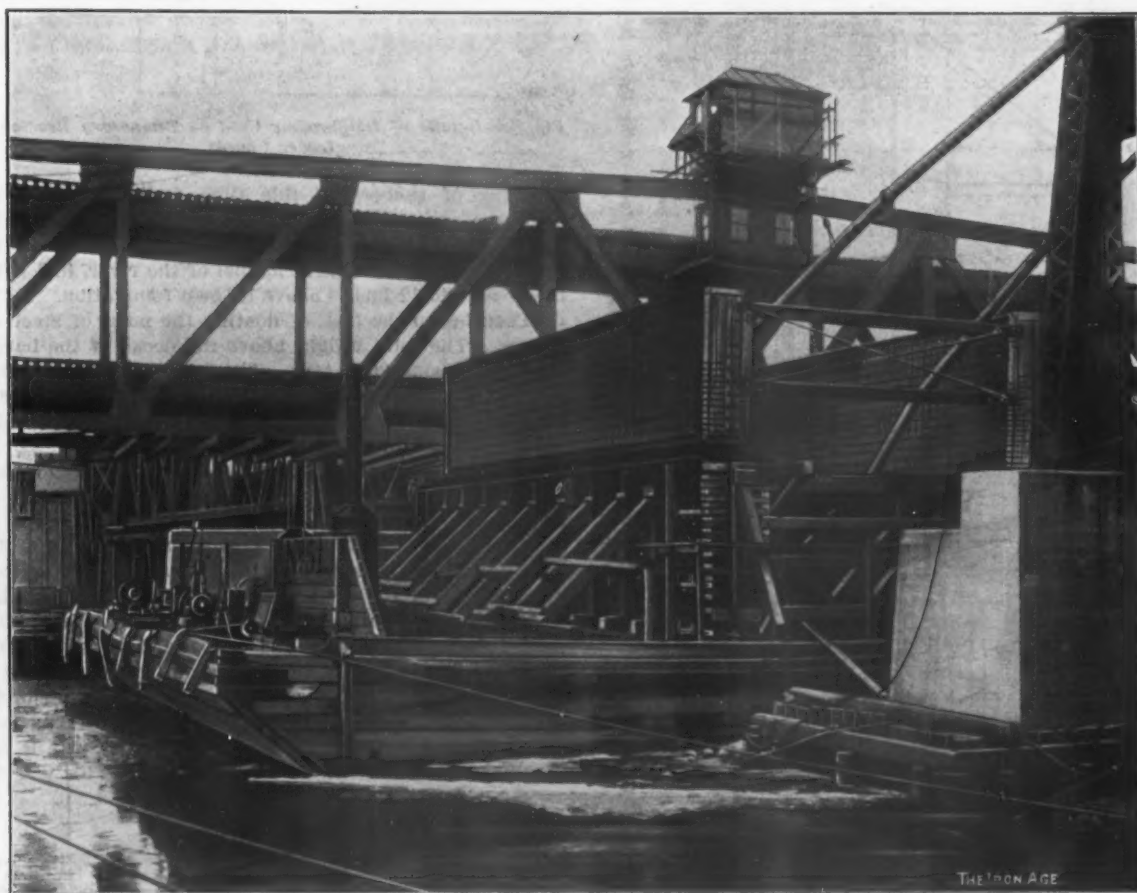


Fig. 2.—One of the Sand Jacks.

A NOVEL ENGINEERING FEAT.

The bridge is of the center bearing type, with all of its weight and load resting on the pivot pier. Temporary diaphragms were placed in the lower chord for reinforcement at the points where the weight of the structure rested upon the plungers. One of these is illustrated in Fig. 4.

The work of shifting the span was commenced early in the morning of the 20th inst. The weather conditions were a great handicap, as the men were obliged to work throughout a driving rainstorm. This caused some apprehension regarding the sand, but it was kept dry by means of large canvas sheets, which are shown covering the sand jacks in Fig. 1.

One of the chief difficulties encountered was due to the variations of the tides. A series of observations as to these variations had been conducted by the engineering department of the Lackawanna Railroad for a number of months, at the Passaic River crossing. These showed that there have been a considerable number of low tides which have not fallen below the mean tide, and that the normal low tide at this point is about $2\frac{1}{2}$ feet below mean, while a large number of low tides have fallen as

structure. In case it should be impossible to release them, the rising tide would again pick up the pontoons and make it impossible to run traffic over the bridge.

It was therefore necessary that the pontoons be placed under the bridge, in its original position, at low tide, and at the next low tide, a little more than 12 hours later, they must be released from beneath it as it laid in its new position.

In order to handle the work safely and take care of the variation of high and low tides that might occur, the engineers made use of water ballast in the scows, not only for lifting the span from its bearings, but for releasing the scows after they had done their work and landed it upon its new foundation. Four centrifugal pumps were provided for pumping the water in and out of the vessels, each with an 8-inch suction and a 6-inch discharge pipe and a capacity of 1600 gallons per minute. These were so arranged that the suction pipes might be thrown into the scows to pump out the water when the bridge was being lifted and into the river when the scows were to be released in order to reduce their freeboard.

Details of the boxes were such that the sand could be released through four horizontal lines of holes in the sides, each hole being 2 inches in diameter. The highest row was 2 feet 7½ inches from the top, the next two lines were 4 feet 4 inches apart, and in the extreme lower corners holes were provided to clear out the boxes perfectly. In addition to these there were two lines of 2-inch

jacks were constructed, were allowed to float on a falling tide under the draw. They slowly drifted into position, being held under control by means of hawsers that connected them with a system of snatch blocks and hoisting engines located on the flatiron of the new pier, 35 feet further up the river. When the tide began to flow again it was nearly 6 o'clock. At that time there was more than 1 foot of space between the top of the plungers and the bottom of the draw. An hour later the plungers began to lift the draw. There was a noticeable absence of

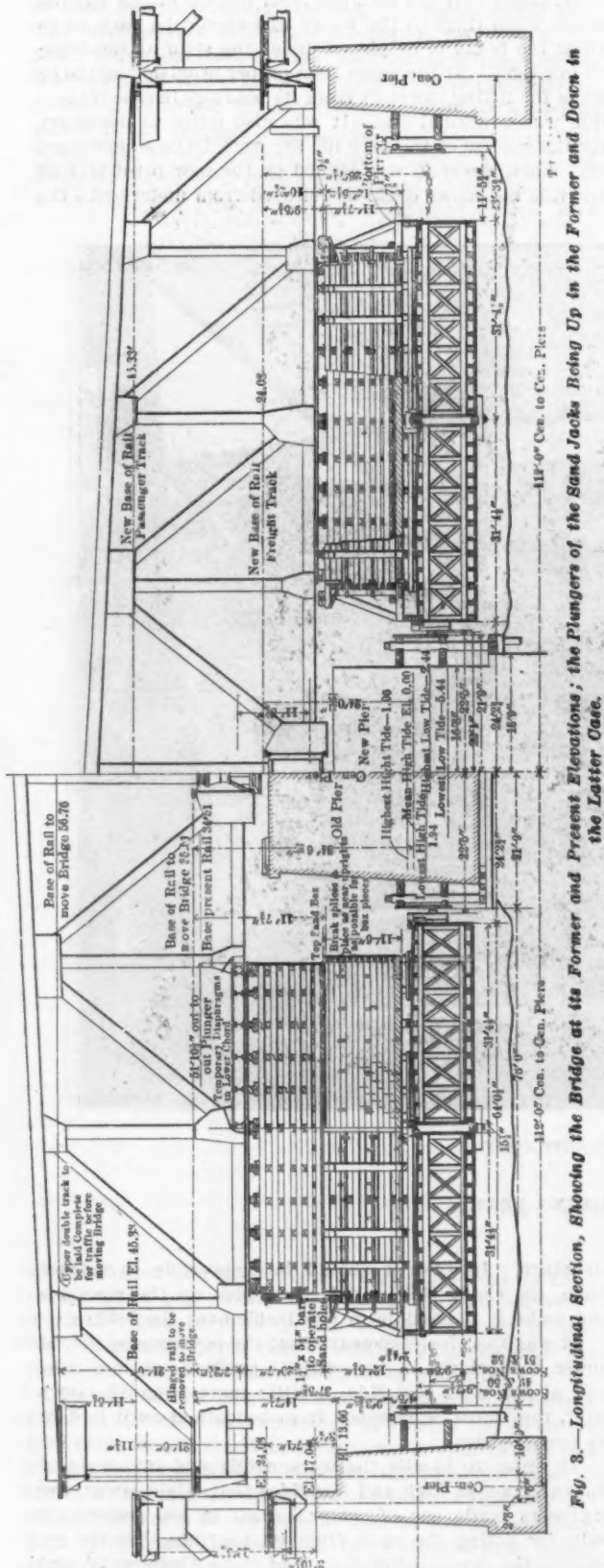


Fig. 3.—Longitudinal Section, Showing the Bridge at its Former and Present Elevations; the Plungers of the Sand Jacks Being Up in the Former and Down in the Latter Case.

holes in the bottom of each box, which were used in releasing the major portion of the sand. The flow of the sand through the holes was regulated by means of wooden slides placed on the outside of the boxes, having holes to correspond to those in the receptacle.

It was 2 o'clock in the morning when the first work of shifting was done, and after breaking the electrical and signal connections the four barges, on which the sand

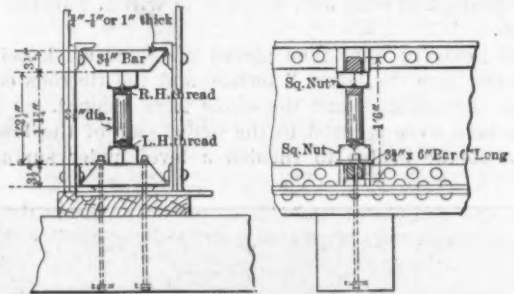


Fig. 4.—Details of Diaphragms Used as Temporary Bracing in Lower Chords.

creaking of timbers at this time, indicating that the weight of the steel structure was being borne by the columns of sand. It was shortly after 8 o'clock that the four barges, two in either channel of the river, had lifted the draw 8 to 12 inches above its own foundation.

Then began the task of floating the mass of steel upstream. The total weight above the decks of the barges was just about 2000 tons. The hawsers were allowed the necessary freedom, and foot by foot the barges and their burden were permitted to drift with the incoming water. It took 18 minutes for the journey.

The incoming tide had raised the barges and their load so that the span was 12 feet 2 inches above its proper resting place.

The process of lowering the draw by means of the sand jacks for more than 10 feet began about 9 o'clock. The balance of the requisite lowering was accomplished by the aid of the falling tide. The 2-inch vents in the bottom of the boxes were opened. As the sand ran out into the holds of the barges the draw began to descend, but at a rate that was hardly perceptible. About one-half of the distance had been gained at 2 o'clock in the afternoon. When the plungers had descended about half way it was necessary to open a row of the side vents. This was the

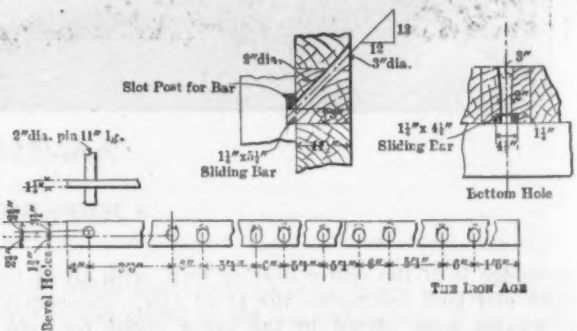


Fig. 5.—Details of Sand Holes and Controller Bars.

A NOVEL ENGINEERING FEAT.

only time that this became necessary. Two hours later the draw had about 2 feet to go, when it was discovered that the Harrison end was too close to the abutment by 15 inches. This meant that the immense weight would have to be shifted. By means of the ropes and hydraulic jacks the engineers evened the draw into perfect position within 10 or 15 minutes. The cone on the bottom of the draw was then resting over the one built on the new pier, and the span was lowered the balance of the distance, the pinion coming in perfect mesh with the rack.

The undertaking proved eminently successful, proving that the sand jack method of lowering heavy bodies gives absolutely smooth working and desirable results.

Before adopting the plan Mr. Bush and his assistants tried two experiments with sand jacks last year. They used jacks 4 feet wide, 6 feet long and 6 feet high for

of American and Canadian competition, but German billets and manufactured steel compete against North of England manufacturers. Nevertheless, steel ship plates are still quoted in Middlesbrough £5 10s., less 2½ per cent. (which is a good deal higher than the Glasgow price); angles, £6; iron ship plates, £6 2s. 6d.; iron angles, £6, and iron rods, £6 2s. 6., all less 2½ per cent.

Shipbuilding.

In regard to shipbuilding on the Clyde, the tide of prosperity seems to be on the ebb. Marine engineering and shipbuilding are face to face with a spell of slackness. Opinion is divided as to the probable duration of this spell, but some are inclined to think it will be a short one. Some idea of all that is comprehended in the statement that our staple industry is on the eve of depression may be found in the number of men employed in our shipyards and engine shops.

There are practically 50 shipbuilding yards on the River Clyde, the majority of which construct engines as well. In addition, there are a score of marine engine concerns who do not build ships. In a busy year these establishments employ about 40,000 men, and at present (apart from seasonal changes and weather causes) fully 30 per cent. of this total are unemployed. For some time past each succeeding fortnight has witnessed a swelling of the idle list. Engineers, platers, fitters, riveters, caulkers, hole borers, drillers, joiners, shipwrights, painters and the minor tradesmen who make up the industrial army of the Clyde have all been affected. The secretaries of the larger trade unions have in their monthly reports been somewhat despondent of late regarding the position of affairs.

In all the trades the number of men drawing unemployed benefit is much greater than in the corresponding period of 1902, and the general impression is of many men being idle. The production of the past ten years was far greater than that of any previous decade, and it is said that the majority of the skilled workmen whose names now figure on the idle books of the various societies have been thrifty and are therefore tolerably well prepared for lean times. Some people declare that a long period of trade depression is approaching, but, except in one or two trades, the number of unemployed in Glasgow is as yet not alarming. Slackness in several industries there is, but certain trades are affected by the seasons, such as masons, joiners, painters and plumbers. Idleness in these and kindred crafts does not necessarily indicate a stagnant state of the labor market.

Pig Iron Prices and Conditions.

Makers' prices of hematite pig iron vary from 52 shillings 6 pence to 54 shillings per ton, according to brand and time of delivery. East Coast and Scotch hematite are about 6 pence lower on the week, and may be quoted 51 and 55 shillings per ton, delivered to the steel works in the respective districts. Scotch warrants are 48 shillings 9 pence cash. The following are merchants' current quotations for the various Scotch brands:

s. d.	s. d.
Coltness, No. 1.....71 6	Dalmellington, No. 1.....51 0
Gartsherrie, No. 1.....59 0	Shotts, No. 1.....62 6
Summerlee, No. 1.....61 6	Clyde, No. 1.....58 6
Calder, No. 1.....59 0	Carnbroe, No. 1.....51 6
Langloan, No. 1.....70 6	Monkland, No. 1.....51 0
Eglington, No. 1.....52 0	Glengarnock, No. 1.....58 0
Middlesbrough G. M. B. f.o.b. Tees, No. 1, 42 shillings 9 pence; No. 3, 41 shillings 9 pence; No. 4 foundry, 41 shillings 6 pence.	
W. C. hematite, mixed numbers, f.o.b. Cumberland or Barrow, 53 shillings.	
E. C. hematite, mixed numbers, 50 shillings per ton f.o.b. Tees.	
Scotch hematite, mixed numbers, 55 shillings f.o.b. steel works.	

At Barrow, when the steel works stop for Christmas, it is probable they will not start again until well on in January, and in this event the probability is the company will shut down some of their five furnaces in blast rather than make more for stock. The outlook is, therefore, anything but bright. Steel makers are on full time with rails and on half time with plates. It is expected the mills will stop this week end. Prices show little or no variation. The annual report of the Millom & Askham Company says that the large importation of foreign iron and steel has compelled them to reduce output. This company used to turn out 200,000 tons of hematite

pig iron per annum, but are now restricting production to the basis of 5000 tons per annum.

In the Northwest Canadian forge iron continues to compete, and has been sold for delivery at Warrington at 46 shillings. Canadian iron could be bought, delivered Manchester docks, at 47 shillings 6 pence and American at about 48 shillings 6 pence, net, but there is not any eagerness about placing orders even at these figures.

In steel billets German quotations remain about £4 4s. for small up to £4 5s. for the larger sizes, delivered into this district. There are low quotations for Canadian billets under £4 per ton, delivered, and American billets continue to be offered about £4, delivered. For English billets makers' quotations range from £4 7s. 6d. up to £4 12s. 6d., delivered, but it is exceptional where more than the minimum basis is got. Where business is to be put through it is only at very low cut prices, and the current market rates scarcely afford a definite basis of actual sale prices.

Our Leeds correspondents tell us that not only do they experience a diminution of orders from Scotland for their iron and steel specialties, but also that the orders from the Continent of Europe have fallen off. They say that Belgian and German makers are now offering iron and steel at exceptionally low prices, delivered at their doors, and that American materials are threatening to displace their makes altogether in the home markets. This is, perhaps, something of an exaggeration—at yet, at any rate—but the statement is reflective of the despondency which exists and is growing.

Possibility of Labor Troubles in Coal Mining.

The arrangement for renewing the Conciliation Board of the Miners' Federation of Great Britain has been rejected by the miners and the present board would expire on December 31, but has renewed its own life for three months to give time for further negotiation. As the miners also rejected the proposal for a reduction of wages, the question went back to Lord James of Hereford as arbiter, who has awarded a reduction of 5 per cent. There is still possibility of a labor struggle in the English coal trade after the New Year, and if there is the Scotch miners are, by resolution, bound to support their English colleagues.

B. T.

Receivership Refused for Tidewater Steel Company.—Judge Johnson, at Media, Pa., on December 28, announced that he had refused to grant the application of the Investment Company of Philadelphia for the appointment of a receiver for the Tidewater Steel Company of Chester, Pa. The application for a receivership alleged that the Tidewater Company had been insolvent since their foundation. The hearing of the case occurred on December 26, and occupied the entire day. In his decision the Judge said that the statement of the officers of the Tidewater Company showed the company to be solvent, and he did not consider it wise to interfere. Under the circumstances, the proceedings have created much comment. A director of the Tidewater Steel Company intimates that proceedings may be instituted against the officers of the Investment Company for the manner in which they have injured the credit of the former company. The application for a receivership was made on Christmas Eve, at the height of the holiday season, when the president was in Pittsburgh and the other officers and directors were scattered for the holidays. It is further claimed that no opposition was expected, and the bill contained allegations which would have caused a receivership to be granted if they had not been proved to be untrue.

The National Drill & Mfg. Company of Chicago, with works at Barberton, Ohio, have opened a branch office in Room 1425 Park Building, Pittsburgh, with I. M. Herbst in charge. The company manufacture contractors and railroad specialties.

Percy E. Donner has resigned as general manager of the Monessen Works of American Tin Plate Company, at Monessen, Pa. His resignation takes effect February 1.

Labor Notes.

In several of the New York dailies for Sunday, December 27, the lawless methods pursued during the past year by the notorious No. 2 local union of the Housesmiths' and Bridge Workers' Union are set forth in great detail. The narration of the misdeeds of the leading spirits in this union constitutes an appalling history of systematic crime which would be thought impossible in any enlightened community in this stage of the world's history. The gang became so accustomed to murder that they were ready to remove members of their own organization if suspected of weakness. The publication of this information, which is the result of extensive detective work, justifies the unyielding attitude of the New York builders toward the organization named.

The Bessemer steel plant of the Republic Iron & Steel Company, at Youngstown, Ohio, started up again on Sunday, December 27. Notices are to be posted this week, prior to December 31, in all the mills of the Carnegie Steel Company in Pittsburgh, the Mahoning and Shenango Valley districts and also at Bellaire and Mingo Junction, advising the men of rates of wages that are to prevail, commencing January 1. The heaviest cut in wages will be in tonnage men, who will be reduced from 15 to 25 per cent.

The employees of the Haselton Works of the American Bridge Company, at Haselton, Ohio, have been notified of a reduction of 10 per cent in wages, effective January 1st.

Blast furnace labor in the New Castle district has been notified of a 10 per cent reduction of wages, effective January 1. Most of the blast furnaces in the Shenango Valley are closed, but some of the stacks are expected to resume early in the new year.

At the Claire furnace in Sharpsville, Pa., and the Ella and Fannie furnaces, West Middlesex, Pa., blast furnace labor has been reduced about 10 per cent. This reduces foremen to about \$2, and common labor to about \$1.50 per day.

Blast furnace labor at Ironton, Ohio, has been notified of a 10 per cent reduction in wages, effective January 1.

Notice has been received at the Milwaukee plant of the American Bridge Company of a reduction of wages to take effect the first of the year. Piece workers are reduced 10 per cent. Salaries below \$4000 a year are reduced 20 per cent., and in those between \$4000 and \$10,000 a 25 per cent. cut is made. Several hundred men are affected. All employees of steel companies and rolling mills in that city not working under contract will receive lower wages after January 1.

The 700 employees of the American Bridge Company, at Trenton, N. J., were also notified of a cut in wages from 1 to 20 per cent. Those receiving wages of \$1.50 or more a day are to suffer a cut of 10 per cent. Twenty per cent. reduction is to apply to those drawing wages that equal or exceed \$4 a day. A similar reduction of wages at the same company's works in Philadelphia went into effect December 28.

The limestone interests in the Mahoning and Shenango valleys have put into effect a new wage scale, which provides for a reduction in labor of about 20 per cent. The scale reduces quarrymen from 20 to 16 cents a ton. The men are mostly foreigners, and accepted the reduction in wages without dissent.

The employees of the Jones & Laughlin Steel Company, Pittsburgh, Pa., have agreed to accept a reduction in wages, ranging from 10 to 25 per cent. In some departments a change has been made from an 8 to a 12 hour turn. Repairs have been made, considerable new equip-

ment has been added, and the works will probably start up again about January 15.

The Sharon Steel Hoop Company, Sharon, Pa., have announced a reduction of about 10 per cent. in wages, effective January 1.

Notices announcing a readjustment in wages at the National Works of the National Tube Company, at McKeesport, Pa., were posted on Tuesday, December 29. The notice reads: "Effective January 1, 1904, a readjustment of wages will be made. The change of rates will affect all employees working day, tonnage, piece or salary basis." In some departments of the works the notice has an addition which reads: "Individual rates can be obtained at department offices." The National Works are idle in all departments while extensive repairs are being made. The cut in wages affects about 8000 men, and is said to range from 10 to 25 per cent. It is expected that part of the plant will start up early in January.

The Pittsburgh Steamship Company's New Manager.

CLEVELAND, OHIO, December 29, 1903.—The announcement is made now that H. Coulby has accepted the proffered general managership of the Pittsburgh Steamship Company, the lake subsidiary company of the United States Steel Corporation. Mr. Coulby has been connected with Pickands, Mather & Co. for a number of years. He has been at the head of their ore and vessel department during that time, and in addition was interested in a couple of steamship companies and in docks on the lakes, and last year became the president of the Great Lakes Towing Company. He has been a member of the Dock Managers' Association, which fixes the terms with the labor unions, and also assesses the charges for unloading the material. He has also been a prominent member of the Lake Carriers' Association, having at one time served as its president. In all ways he is admirably adapted for the work of taking charge of such a big company as the Pittsburgh Steamship Company, which this year shipped about 13,000,000 tons of ore and had in commission 110 boats.

Recent Car Orders.

CHICAGO, ILL., December 30, 1903.—Car building operations are resuming activity in the West. The Chicago & Northwestern Railway has just placed an order for 250 refrigerator cars and 300 box cars with the Haskell & Barker Car Company of Michigan City, Ind. The Pullman Palace Car Company have an order for 100 gondola cars for the Denver, Salt Lake & Pacific Road. The Pere Marquette Railway has placed an order for 1000 freight cars, and will follow with 2000 in a few days. The Western Steel Car & Foundry Company are just finishing a lot of 300 freight cars for the C. & E. I., and have begun operations on an order for 1000 freight cars for the New York Central. The Harriman interests, notably the Union Pacific and the Chicago & Alton, the Oregon Short Line and the Kansas City Southern, have been figuring for some months on upward of 20,000 cars, though it is understood that no orders have yet been placed. The rumor that the Illinois Central has placed an order for 500 cars is denied by officials of that road, who state that they have not the slightest contemplation of adding to their equipment in any way at present. It is understood that the American Refrigerator Transit Company of St. Louis have placed an order for 1000 refrigerator cars with the Haskell & Barker Car Company, but the parties interested decline either to confirm or deny the report.

H. W. Hayes & Co., New England agents for Cambria Steel Company, who have been located for a number of years in the Mason Building, announce that on January 1, 1904, they will move to the Paddock Building, 101 Tremont street, Boston, where they will retain the same telephone number.

The Iron Age

New York, Thursday, December 31, 1903.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

The Foundry Exhibit at St. Louis.

The movement for the establishment of a foundry exhibit at the St. Louis World's Fair is at last taking shape. This is a project which has long been in contemplation among those enthusiastic foundrymen who are seeking, through co-operation and organization, the improvement of the foundry trade. They made but slow progress for many months, as it was difficult to win sufficient support to the scheme to make success seem possible. That the matter has finally assumed practical shape is probably due to the fact that the trade can be reached in these days through the associations which have been established.

The foundry trade has become conspicuous in recent years for the vigorous manner in which its members are working for mutual improvement. Not many years since this trade was without any regular means of consideration or discussion of matters of vital interest or importance. When foundrymen met, it was usually as competitors over some contract. They separately pursued their own ends, not because they were selfish in their desire to secure individual advantage, but simply because business men in no line were then organized. Through the evolution of time and the modern progress toward concentration and co-operation foundrymen have been brought together in national and local organizations. They have thus been enabled to compare experiences, interchange opinions, present improved methods of conducting foundry operations, inspire in one another a desire to delve deeper into applied science and in other ways advance their mutual interests.

It is only as a result of their closer communication with one another that the foundrymen of the country have been brought to regard the St. Louis Exposition as a favorable opportunity for still further cementing the bonds of fraternity which have been created, and making a greater advance toward the education of the craft in general. The project which has most commended itself is the establishment of a special exhibit in the form of a model foundry, which would at the same time form a foundrymen's headquarters during the term of the exhibition. The undertaking is quite formidable, and considerable time has been required to elaborate the details, so that the scheme might not discourage the trade by its apparent magnitude. Under the direction of Dr. J. A. Holmes, chief of the department of mines and metallurgy, numerous consultations have been held between prominent foundrymen in the leading foundry centers of the country, and a plan has been evolved which is set forth in a circular now being sent out under the auspices of the National Founders' Association, the American Foundrymen's Association and the Philadelphia, New England, Pittsburgh and St. Louis local associations. Contributions are being asked from the foundrymen of the country and those interested in foundry equipment toward the construction and maintenance of a special building to be used for this purpose. It is desirable that operating foundry exhibits be installed in a special building adapted

to this purpose. Such exhibits will not only be thus concentrated as they should be, but they will be surrounded by other exhibits connected with the foundry trade, which will enable the visiting foundryman to appreciate the improvements in methods and machinery which have been brought forward in his trade.

As this is the first time in the history of great expositions in this or any other country that the foundry interests have been especially recognized, it is earnestly hoped that the work of the committee having the matter in charge will be so thoroughly appreciated that contributions ample for the purpose will be supplied. An undertaking of this character cannot be carried through creditably without a sufficient fund to enable the details to be conducted without pinching economy. Those who have the matter in charge are not extravagant in their views and do not expect to make a lavish outlay. It is absolutely necessary, however, that enough money be provided to erect a suitable building, to fit up the rooms for the headquarters and to secure the services of experts in charge of the foundry operations. The cost of installing the foundry equipment and the simpler operations will be borne by the individual exhibitors or manufacturers. The circular which is being sent to foundrymen expresses the belief that a foundrymen's headquarters and an exhibit of foundry equipment, such as is now proposed, will arouse a new interest in the foundry industry of the United States, and will help the people of this country to appreciate the importance and nature of this great industry.

The Insulator and Long Distance Transmission.

The problem of long distance transmission of electric power has come down to the question of insulators for supporting the wires. Very rapid strides have been made in this work during the past year or two, until 40,000 is a common voltage, and now 60,000 is being successfully applied, one such line being in operation in the State of Washington, while another is being installed in California, in both instances bringing water power many miles to the consumer in the form of electricity, to be distributed at a low potential for electric lighting, traction and general power purposes. The electrical experts are now looking to see the 100,000-volt current in practical and economical service before a great while, which will mean that power may be transmitted from 800 to 1000 miles, which is probably as great a demand as will be made for a long time upon an electric power system. Electric machinery is ready to furnish this voltage to the wire, and to step it down to commercial voltages at the other end. Everything is in readiness but the insulator. Insulation of the wire itself does not so much matter, for usually the wires which carry the electric current over these great distances are not covered. The physicist is doing his part to procure the insulator for the higher potentials, but the chemist is doing more, for it has really come down to a problem in electro-chemistry. The physicist may determine the best form of insulator, but the chemist must determine the material from which it shall be made.

As the insulator develops in efficiency it means less and less loss of power between the source and application, and that means greater cheapness. It means that the day when it will pay to send the power of small water privileges to a consumer miles away is getting nearer. In all electrical science to-day this matter of the development of the insulator for transmission wires is one of the most important commercially.

One stumbling block in the way of high potential currents has been the fear of the public, who look upon the wires as endless lines of living death. The electrical engineer makes easy answer. These currents are deadly, but no more deadly than the electric light wires that thread busy communities everywhere. A 100,000-volt current will be no more deadly than the 300 volts of the electric light wire, or even the 600 volts of the trolley wire, the tremendous volume of which makes up for the lower pressure. All are sure death. But the public is getting used to the danger of live wires, and by the time the 100,000-volt current arrives it will be regarded with no more dread than is the electric light wire of to-day.

The Agricultural Machinery Trade.

American manufacturers of agricultural machinery are planning to curtail their production for the trade of 1904. They give as their reason the unsettled condition of the market on their raw materials, especially steel. Some of their material was contracted for months ago at high prices. Their steel has not dropped, but they expect it to be lower before the time comes for marketing their machines. Some of them have not yet begun the manufacture of certain lines of machines, hoping for the decline in raw materials, although usually they have produced a considerable part of their stock for the season by the New Year. Estimates put the curtailment of agricultural machinery production at nearly, if not quite, 25 per cent. In most parts of the country the farmers are in excellent financial condition. They have had fine crops, and have received good prices for them. The export trade in agricultural machinery promises to be as good as last year, although the manufacturers say they do not expect to see an increase. The 1903 machines went well, and there is no more than the usual amount of stock on hand. In this line of manufacture the season's business has to be carefully estimated in advance, as if there is an under supply there is no chance of making it up in the season. Raw materials will certainly be no higher. In fact, lumber and some other materials entering into agricultural machinery are somewhat lower. So the price to the farmer will be no higher. It looks as if the average farmer who planned to buy new machinery in 1904 will buy it, even if general trade conditions are not up to what they have been. But the manufacturers believe otherwise, and their views, as important consumers of iron and steel, must be taken into consideration in forecasting the future.

The desire of the labor leader to keep his job by making something for himself to do is well illustrated in various parts of the country where demands are being made for shorter hours and more pay in the face of conditions which put the employer of labor in a position so independent that he may even welcome a strike that will relieve him of the obligation that many men feel to keep their employees at work even though they are piling stock against their business judgment. If there ever is a time when labor should co-operate with capital it is at the beginning of what may be a serious business depression. If the workman makes trouble he is injuring himself a thousand times as much as he is injuring his employer. Yet cases are reported from none too busy manufacturing establishments where men are actually going on strike for more wages, when the whole tendency of the country is to put wages back a little toward what they were before the time of great prosperity came.

OBITUARY.

HENRY M. BOIES.

Col. Henry M. Boies, one of the leading citizens of Central Pennsylvania, died suddenly on December 12, at the Hotel Sterling, Wilkes-Barre, on his way from Washington to his home at Scranton. The cause of his death was heart failure, resulting from acute indigestion. Colonel Boies was born in Lee, Mass., in 1837. He was the descendant of a French-Huguenot family forced to flee during the religious persecutions in France in the seventeenth century and who settled in Boston, Mass., where they established the first paper mill in America. He gained the foundation of his education in the public schools and then entered Yale College, from which he graduated in 1859. The following year he joined and served with the corps of zouaves organized in Chicago by Ellsworth. Later he was a member of the firm of Silver & Boies, engaged in the freighting and forwarding business at Tivoli, N. Y. He removed to Scranton in 1865 as resident member of the firm of Laffin, Boies & Turck, powder manufacturers, and four years later became president of the Moosic Powder Company. Noticing that there were many fatal accidents in mines on account of the careless handling of cartridges by lamplight, and desiring to remedy this evil, in 1873 he invented a cartridge package for mining powder that was almost universally adopted. In the spring of 1882 Colonel Boies became president of the Dickson Mfg. Company, and during the four years he held this position his judicious management was manifest in the increased business of the company, the enlarged works and the introduction of the hydraulic system of flanging and riveting. While with this company he invented a steel tired car wheel, now manufactured by the Pressed Steel Wheel Company, successors to the Boies Steel Wheel Company. He also served as director of other leading manufacturing companies. In the organization of the Third National Bank of Scranton he took an active part and for ten years was a director. In 1886 Governor Beaver appointed him a member of the State Board of Charities, on which he was a member of the Committee on Lunacy and the Executive Committee. He was also identified with the National Prison Association, and as a fruit of his labors in this and other philanthropic societies published in 1893 a volume, entitled "Prisoners and Paupers," which presents a study of criminality and pauperism, with suggestions for remedy. He also wrote an exhaustive work recently on "The Science of Penology," which has already become an acknowledged text book on this subject. A widow, two sons and two daughters survive him.

NOTES.

WM. H. DAVOL, who died December 15, 1903, was born in February, 1840, at Warren, R. I., and came to New York when nine years old. His first business experience was with Hart, Bliven & Mead, hardware dealers. He entered the firm of Jno. Davol & Sons, of which his father was the senior member, about 35 years ago, and at the same time entered the Brooklyn Brass & Copper Company, to the presidency of whom he succeeded after his father's death in 1878. He was a man well known in the brass and metal trades, was a trustee of the Hamilton Trust Company of Brooklyn, the Metal Exchange and the Brooklyn Brass & Copper Company, of whom he was president at the time of his death. He was also a director in the Mitchell Vance Company and the Riley-Klotz Mfg. Company of Newark, and a member of the Montauk and Fulton clubs. He left a son and two daughters.

CHARLES M. CHAMBERLIN, president of the Edwards & Chamberlin Hardware Company, Kalamazoo, Mich., died at his home in that city on Friday, 27th ult.

WM. DONNELLY of Ford & Donnelly, proprietors of the Kokomo Foundry & Machine Works, Kokomo, Ind., died December 7 at Kokomo as a result of heart failure. Mr. Donnelly was 73 years of age at the time of his death, and his whole life had been spent in the iron business in one form or another. During the Civil War he was connected with a small blast furnace in the Cumberland Valley, and was burned out in Lee's raid. Later he

operated a foundry in Shippensburg, Pa., and still later was connected with the Harris Iron Works in Titusville, Pa. He went to Kokomo and formed the partnership known as Ford & Donnelly with Mr. C. A. Ford 15 years ago.

THOMAS CYPRIAN FRENYEAR, sales manager of the new Canadian Westinghouse Company, died of typhoid fever at Fort William, Canada, on December 10. His is the first death in nearly five years among the higher officials of the Westinghouse Electric Company. Mr. Frenyear was born on March 16, 1865, at Middletown Spa, Vt. He began his business career before he was 15 years old in the office of the Boston Electric Company, where an uncle, W. R. Nutting, was manager. He was graduated from Phillips Exeter Academy in 1885, paying his way by keeping a book store for students. A business reverse put an end to his efforts to gain a collegiate degree in Boston University. For several years he was in the employ of the Thomson-Houston and Brush Electric companies as a salesman, with his headquarters in Buffalo. From 1892 to 1895 he was superintendent of the Cayadutta Electric Railroad. In the fall of 1895 he entered the employ of the Westinghouse Electric & Mfg. Company, and on November 1, 1903, was placed in charge of the sales department of the new Canadian company, with headquarters in Toronto. He leaves a widow and three children.

GEORGE H. PALMER, secretary and treasurer of the Palmer & De Mooy Foundry Company, Cleveland, Ohio, died on December 6, at his residence in that city. Mr. Palmer was born in Oshkosh, Wis., on May 2, 1860, and was taken to Cleveland when three years old by his parents. At the age of 21 he became interested in the foundry business, assisting to establish the firm of Palmer & De Mooy. For years he held a prominent place in local business circles. A widow and two children survive him.

WILLIAM DONELLY of the Ford & Donnelly Iron & Boiler Works, Kokomo, Ind., died December 7, aged 68 years. Many years ago Mr. Donnelly was a prominent iron manufacturer in Pennsylvania.

MAJOR MALCOLM McDOWELL, an old and well-known resident of Chicago, died suddenly Christmas night. Major McDowell was the inventor of the steel plow beam and also of many appliances and methods now widely used in rolling mills, furnaces and foundries, and as an iron and steel expert was prominently known throughout the country. He was the youngest brother of Major-General McDowell, commander of the Federal forces at the first battle of Bull Run, on whose staff he served as *aide de camp* in that engagement. He was also a brother of General John A. McDowell, who commanded the Iowa brigade in the battle of Shiloh. Major McDowell was born in Columbus, Ohio, in 1828, and at the age of 23 married Jane Welsh Gordon of Cincinnati who with five children survive him.

GEORGE ALBERT ELLIS, a well-known civil engineer, died December 27 in Springfield, Mass., aged 60 years. For 12 years he was city engineer of Springfield. Leaving there in 1886 he had been engaged in constructing water works, sewers and electric plants in cities of the West and South until a year and a half ago, when he returned to Springfield.

SIR WILLIAM ALLAN, the well-known engineer, ship owner and member of Parliament, died December 28 from heart disease, at his residence in London, England, aged 67 years. He was born in Dundee, Scotland, and was educated there, starting life as a marine engineer. After a term in the British navy he entered the merchant service and met with many adventures as chief engineer of a blockade runner in the Civil War, being captured and confined in the old capitol prison. After the close of the Civil War he entered the employ of the Northeastern Marine Engineering Company, of which concern he was manager for 15 years. Afterward he became connected with the Scotia Engine Works, at Sunderland, and other large concerns, and at the time of his death was chairman of the Allan Line and a director of Richardsons, Westgarth & Co. Sir William was elected to represent Gates-

head in the House of Commons in 1893 and continued a member of Parliament up to the time of his death. He was knighted in 1902. He was interested in literature and published several volumes of poems.

PERSONAL.

George W. Parsons has resigned the superintendency of the frog, switch and signal department of the Pennsylvania Steel Company, a position he has held for many years. He will be succeeded on January 1 by Charles W. Reinochl, now the company's sales agent at Steelton, Pa.

C. A. Carscadin, for many years traveling passenger agent of the Michigan Central Railroad, with offices at Buffalo, will sever his railroad connection January 1, to take a position with the Detroit Malleable Iron Company.

The Pocahontas Coal & Coke Company announce the following changes and appointments taking effect January 1, 1904: M. J. Caples, to be general manager, with office at Roanoke, Va. O. Lynn Bottomley, to be treasurer, vice M. J. Caples, with office at Roanoke, Va. Mr. Bottomley will continue to act as secretary. E. H. Alden, to be assistant secretary, with office at Philadelphia. The office of superintendent will be discontinued.

John Chappell of New Castle, Pa., head of the Statistical Bureau of the United States Steel Corporation, has resigned his position, effective January 1. Mr. Chappell was formerly district vice-president of the Amalgamated Association, at New Castle, and may return to that organization in some capacity.

Charles McSwigan, for some years press agent of the Carnegie Steel Company, at Pittsburgh, has resigned his position, effective January 1, and after that date will represent a New York stock brokerage house in Pittsburgh, with headquarters in the Frick Building. The position of press agent of the Carnegie interests has been abolished.

Edward Corey has been appointed general manager of the new tube works being erected by the United States Steel Corporation, at Lorain, Ohio. He is a nephew of W. E. Corey, and was formerly employed at the McKeesport Works of the National Tube Company.

David J. Evans has severed his connection with the Chicago office of the Lorain Steel Company and has also resigned his position of secretary-treasurer of the North American Railway Construction Company. He has taken an office at 1564 Monadnock Building, Chicago, where he will handle railway supplies, iron and steel. Mr. Evans has been connected with the Chicago office of the Lorain Steel Company, and their predecessors, the Johnson Company, since early in 1893, having had charge of the business for the past three years, during the sojourn in Colorado of A. S. Littlefield, Western sales agent.

C. W. Townsend, who has been connected with the Chaplin-Fulton Mfg. Company of Pittsburgh for the past 18 years, and for the last ten years as director and secretary of the company, has resigned on account of ill health. He will spend the winter at Orlando, Fla.

William G. Coats, who for a number of years was supervisor of the Pennsylvania Railroad, at Jersey City, has resigned, to enter the Taylor-Martin Engineering Company, Incorporated, of Newark, N. J. As secretary of the company Mr. Coats will conduct the contracting or purchasing department, as the company cover the engineering field from both the consulting and contracting ends.

Arthur Boswick, formerly of the Homestead Steel Works, has been appointed chief metallurgist of the United States Steel Corporation, with offices in the Carnegie Building, Pittsburgh. He succeeds H. E. Martin, resigned.

Joseph Wharton of Philadelphia has been elected president of the American Iron and Steel Association, taking effect January 1. He succeeds B. F. Jones of Pittsburgh, who died May 19, 1903, in the nineteenth year of his incumbency of that office.

MANUFACTURING.

Iron and Steel.

The Wheeling Steel & Iron Company have ordered the resumption of work at the plate and puddling departments of the Benwood mill. The puddling furnaces have been idle for some time.

The new blooming mill of the Eastern Steel Company, at Pottsville, Pa., is under roof and the machinery is being set up. The erection of 125-foot stacks at the open hearth department has been commenced and the furnaces will be ready for operation as soon as the lining of fire brick is completed. The work of erecting stacks at the soaking pits has been started, and as soon as completed the steel mill will be started.

Because of the refusal of the skilled laborers to accept a reduction of 10 per cent. in their wages, the plant of the New Haven Iron & Steel Company, New Haven, Conn., has been closed indefinitely.

Three of the five blast furnaces of the Pennsylvania Steel Company, at Steelton, Pa., are out of blast. All are being repaired, and it is expected that two at least of those idle will be put in operation shortly after the beginning of the new year. The production for the past week has been one of the smallest of the year.

The Independent Rolling Mill Company, Cuyahoga Falls, Ohio, will install an 8-inch mill in their plant, provided the town of Cuyahoga Falls will grant adequate fire protection.

The Phoenix Iron Works Company, Ashtabula, Ohio, have been dissolved. There has been, however, practically no change in the business, as C. O. Tinker, secretary and superintendent, who has purchased all the stock, thought best to surrender the charter. Mr. Tinker will continue the business.

In the case of the North American Trust Company of New York against the Eastern Tube Company of Zanesville, Ohio, an appraisal of the plant has been made on the basis of \$160,000, and it will be offered for sale on February 10 next. Some months ago the concern went into the hands of a receiver, and the sale is the outcome.

During the idleness of the Tod furnace of the Youngstown Steel Company, recently blown out, the stack is being very extensively remodeled. Chief among the improvements is an entire new top and installation of a complete charging device, including new skip bridge with automatic charging buckets. Other repairs at the furnace embrace new blast piping and construction. The work is being done by the William B. Pollock Company of Youngstown, Ohio, blast furnace builders and erectors of all kinds of steel plate construction.

All the blast furnaces of the Carnegie Steel Company, at the Ohio Works, Youngstown, are idle this week. Stack No. 1 was banked before Christmas, but will probably blow in after January 1. Stack No. 2 has been relined and is ready for blast, but has not been started. Stack No. 3 was blown out some weeks ago for relining and repairs and will be idle for some time. The new stack, known as No. 4, will not be completed before April owing to delay in delivery of engines and for other causes.

The open hearth steel plant of the Carnegie Steel Company and the rod, wire and wire nail mills of the American Steel & Wire Company, at South Sharon, Pa., which have been idle for some months, are expected to be in operation during January.

Duquesne Furnace No. 3 of the Carnegie Steel Company, at Duquesne, Pa., which was blown out about three months ago for relining and extensive repairs, was started up on Monday, December 28, making three out of the four stacks at this plant now in blast. Furnace H of the Edgar Thomson plant of the Carnegie Steel Company, at Bessemer, which has been idle about three months for relining and repairs, will be blown in this week. Two of the Carrie stacks, at Rankin, which have been idle for some time for repairs, will be started up as soon as possible.

The new additions to the armor plate department of the Homestead Steel Works of the Carnegie Steel Company are expected to be completed and put in operation early in January. The additions include new machine shop, new reheating furnaces, press shops and the largest armor plate press in the world. It is said that the improvements cost about \$2,000,000 and the capacity of the plant has about been doubled.

General Machinery.

The National Valve Company, recently incorporated to take over the Vincent Valve Company, Sandusky, Ohio, have organized by the election of John G. Schurtz, president, and William E. Guerin, Jr., secretary.

The Sucker State Drill Company, Belleville, Mo., have incorporated under the same name with a capital stock of \$35,000.

The A. Streit Machine Company, Cincinnati, Ohio, whose plant was recently destroyed by fire, have secured permanent quarters at 1108-1110 Harrison avenue, which they will have in operation January 4. A great many of the tools were not injured and the company will make no purchases at the present time.

The recently organized Tate Mfg. Company, Chicago, Ill., have not yet decided whether they will erect a plant. They expect in the near future to patent a device for running ma-

chinery, and as soon as this patent is secured the matter of a plant will be taken up. At the present time they are having their patent mail bag catcher and other specialties made by contract. Address all communications to N. O. Tate, president, care of the International Real Estate Company, 511 Jackson Boulevard, Chicago.

The Brooks works of the American Locomotive Company, Dunkirk, N. Y., are completing a number of improvements, including the installation of a compound direct connected Brown Corliss engine of 800 horse-power and a 500-kw. General Electric generator. A number of new motors will be installed at once, greatly increasing the shop capacity. A new wheel shop, 120 x 225 feet, is nearing completion, which will be thoroughly up to date, the equipment including a number of electric traveling cranes, a 101-inch driving wheel and a new quartering machine. The floors are of tar concrete. All departments of the works are running full and orders for many months ahead are reported.

The Pittsburgh Gauge & Supply Company, Pittsburgh, Pa., manufacturers and jobbers of mill, mine, machinists' and railroad supplies, recently sent a complete machine shop equipment to Ireland. The shipment consisted of lathes, drills, presses, shafting hangers, belting and large and small tools. This company are constantly making foreign shipments, especially to Great Britain, of their White Star oil filters and other Pittsburgh steam specialties.

At a meeting of the stockholders of the newly formed Advance Machinery Company, held at Toledo, Ohio, December 17, the following were elected directors and officers: J. A. Taggart, president; E. J. Woodison, vice-president; Z. B. Taylor, secretary and treasurer; F. E. Calkins and Francis C. Marshall.

S. P. Knapp, proprietor of the Farmer City Machine Shop, Farmer City, Ill., sustained loss by fire December 13 to the extent of \$6000, with \$2000 insurance. In rebuilding his shop, Mr. Knapp will be in the market for an 18 or 20 inch engine screw cutting lathe, one wood planer and wood jointer, one band saw, and other iron and wood working tools and machinery for machine shop equipment.

The elevator and special electrical machinery plant of G. D. Haynes & Co., Cincinnati, Ohio, is to be sold at auction January 4. The equipment consists of lathes, radial drill presses, band saws, grinders, &c.

W. W. Wainwright, Connersville, Ind., mechanical engineer, announces the completion of his new shop. He is now ready to do all kinds of machine, foundry and forge work. He also carries a large stock of power transmission machinery and steam and electrical specialties.

The Straubel Machine Company, Green Bay, Wis., have installed a nickel plating department at their plant.

The National Supply Company, Toledo, Ohio, are erecting a forge shop, 110 feet square, at a cost of about \$10,000; a warehouse, 100 x 150 feet, at a cost of \$20,000, and a power house, 100 feet square, at a cost of about \$12,000.

The C. O. Bartlett & Snow Company, Cleveland, Ohio, report that improved conditions are apparent during the last few weeks. They are securing a number of new orders because of the fact that large steel plants are closed for repairs. They are erecting a crusher and coal conveying outfit capable of handling 40 tons per hour for the Newburg mills of the American Steel & Wire Company and a similar outfit for a plant near Chicago. They are building a large Portland cement outfit for the Owen Sound Portland Cement Company of Vancouver, British Columbia, and a conveying outfit for handling large hot rivets for the Vulcanus Forging Company of Cleveland.

The Peter Gerlach Company, Cleveland, Ohio, manufacturers of stave and barrel making machinery, can hardly appreciate the general complaint of falling business, as they state that December has been the best business month in their history. Large crops of fruit and the increased production of oil have caused heavy demands for barrels, and as a result a great many people are going into the cooperage business, which occasions a demand for new equipment.

The Wellman-Seaver-Morgan Company, Cleveland, are offering for sale the old manufacturing plant formerly occupied by the Webster, Camp & Lane Company, at Akron, Ohio. The property includes six buildings, covering 41,000 square feet, located in the center of Akron. The buildings were occupied by the Webster, Camp & Lane Company prior to the erection of the immense new plant at Akron.

The Safety Steel Derrick Company of Bowling Green, Ohio, manufacturers of portable steel derricks for oil wells, have decided to remove their plant to Deshler, Ohio, and will shortly commence the erection in that place of a brick, steel and stone fire proof factory building, 45 x 150 feet. No new machinery will be required.

The Southwestern Machine & Supply Company, Oklahoma City, Okla., have incorporated with a capital stock of \$50,000 to deal in threshing machines, engines, boilers, cotton gins, clover hullers, corn shellers, saw mills, well drills, gasoline engines, mill machinery, &c. The officers of the company are: President, A. C. Hinde; vice-president, J. E. Parker; secretary, J. A. Tobin; treasurer, P. J. Gibbons; general manager, Jas. A. Tobin. The company will occupy a large four-story building and are now ready to contract for the above lines of machinery.

Power Plant Equipment.

The Orleans Boat & Machine Company, West Derby, Vt., recently organized, have purchased the old Reed machine shops and are erecting on the property a new building, 36 x 100 feet, which with the two old buildings on the site will be used to build steam and gasoline engines, launches, &c. They have purchased most of their machinery, but are now in the market for a good second-hand milling machine of A1 make. The officers are H. W. Darling, president; Dr. C. V. Boyne, secretary and treasurer, and George W. Reed, general manager.

The Valentine Gas Engine Company were recently incorporated at Westfield, N. J.

The Indianapolis-Coaledo Fuel Company, Indianapolis, Ind., have organized to manufacture a patent fuel. A large plant will be erected at Indianapolis, machinery for which is to be supplied from St. Louis, except boilers and engines, which have not been contracted for. This company are capitalized at \$150,000. John B. Allen is president, Geo. Fulwell vice-president, and D. H. Jackson secretary-treasurer.

The Union Steam Pump Company, Battle Creek, Mich., have increased their capital stock from \$375,375 to \$450,875.

The Corinth Engine & Boiler Works, Corinth, Miss., recently organized, will install a new plant. All communications should be addressed to J. E. Creary.

The McGregor Automatic Boiler Feed Company, Detroit, Mich., have incorporated with a capital stock of \$50,000, the incorporators being Norman R. Roadhouse, Thomas L. McGregor, Robert H. Murray, Francis Tricker and Charles Kudner. The company will place on the market a machine to regulate water supply to boilers. This will be made for the present by others, but later arrangements will be effected for the manufacture of the machine by the company themselves, at which time they will be in the market for tools in the iron and brass finishers' line.

The Worcester Polytechnic Institute have sold one of their oil transformers to the C. S. Knowles Company, Boston, Mass., and it has been installed in the company's plant at New Lexington, Ohio. This transformer was the first of two built by the institute in conducting their series of tests of high potential currents. With it 125,000 volts were obtained. The Knowles Company buy it for testing insulators manufactured for a new power transmission line in California. This line will carry a 60,000-volt current, and the insulators must be tested, under the contract, to 80,000 volts, which can easily be accomplished by the oil converter. The second converter of the kind built at the Worcester Polytechnic has accomplished a 500,000-volt current.

The Pittsburgh Boiler & Engine Company, 904 Park Building, Pittsburgh, report sales of 500 horse-power McNaul water tube boilers to the Anchor Brewing Company and the Chartiers Valley Water Company.

The Commissioners of Public Works, Milwaukee, Wis., will receive bids until February 1 for a pumping engine, boiler and auxiliary machinery for the Kinnickinnic River flushing tunnel.

A charter has been granted at Harrisburg, Pa., to R. Munroe & Sons Corporation to manufacture engines, boilers and machinery at Pittsburgh. The company have a capital of \$300,000, and R. Munroe is the principal stockholder.

The plant of the Cascaden Mfg. Company, Waterloo, Iowa, which was almost totally destroyed by fire December 14, with a loss of about \$75,000 and insurance of \$35,000, will be rebuilt immediately, most of the machinery having been ordered. The Cascaden Mfg. Company are successors to the Davis Gasoline Engine Company, makers of stationary pumping and portable gasoline engines and a long line of agricultural implement specialties. Thomas Cascaden, Jr., is president.

The Nashville Street Steam Heating Company, Nashville, Tenn., of which W. L. Horn is secretary, will erect a steam heating plant at a cost of \$300,000. The company are not yet ready to consider the mechanical equipment.

The National Engine Company, Buffalo, N. Y., have been incorporated with a capital of \$40,000, for the manufacture of engines under patents issued to George C. MacDonald. The directors are George C. MacDonald, Martin W. Kribbs and George M. Kellogg, all of Buffalo.

The Electrical Development Company, incorporated to develop electric power at Niagara Falls, Ont., for the Toronto & Niagara Power Company, and in which Frederick Nicholls, Wm. Mackenzie and other Toronto capitalists are interested, have decided to erect a power house of solid granite, 200 x 425 feet, to cost about \$400,000.

The foundation of the electric light and power house of Booser Brothers & Kilgour, on the Elkhart River, a mile west of Benton, Ind., was washed out by heavy floods December 26, wrecking the building and letting \$25,000 worth of machinery fall into 15 feet of water; loss \$15,000. The plant will be rebuilt in the spring.

The Commissioner of Indian Affairs, Washington, D. C., will receive bids until January 21 for an electric lighting system for the Cherokee School, N. C.

The New York & Long Island Traction Company, which is headed by Cleveland people, are making additions to their power plant. The placing of contracts is in the hands of George Stan-

ley, of the Cleveland Construction Company, Cleveland. A contract has been placed with McCloud & Co., Chicago, for steam piping.

The Toledo Eccentric Pump Company, Toledo, Ohio, have been organized with \$10,000 capital stock by W. C. Buck, W. J. Anson, C. W. Klauser, W. E. Dittenhaver and others of Toledo. They have opened offices at 851 Spitzer Building and will manufacture steam pumps.

Newspaper reports recently stated that the Twentieth Century Heating & Ventilating Company of Akron, Ohio, manufacturers of furnaces and ventilating apparatus, have decided to remove their plant to Ashland, Ohio. The officials of the company desire to announce that they have no intentions of removing their plant to Ashland or any other place, and that they are satisfied with conditions in Akron, all reports to the contrary notwithstanding.

Foundries.

The new buildings of the Wilmington Malleable Iron Company, Wilmington, Del., are nearly completed, and as they are ready for occupancy the company are installing their machinery. The new plant will probably be in operation by January 1.

The Union Iron Foundry, Seattle, Wash., expect to have their new foundry in operation January 1. The building will be 80 x 120 feet and equipped throughout with modern machinery. All the machinery has been purchased.

The Griffin Wheel Company, Chicago, have increased their capital stock from \$3,000,000 to \$4,000,000.

The Phoenix Iron Works, Meadville, Pa., have completed the building of a new foundry, 50 x 220 feet, built of brick and steel, and which is equipped with modern foundry appliances throughout.

The Sharon, Pa., plant of the American Steel Foundries started up last week. The men agreed to accept a reduction of 10 per cent., dating from December 1.

The Union City Foundry Company, Union City, Pa., have incorporated for the manufacture of Barrett steam and hot water improved sectional cast iron house heaters and to do general foundry work. They are building a new foundry, 50 x 105 feet, with an L for pattern and machine work, and an engine and boiler room, 50 x 60 feet. A switch connecting the plant with the railroad will facilitate the handling of material. The power plant will comprise a 40 horse-power boiler, 20 horse-power engine, and a 20 horse-power Clayton air compressor, all of which with the exception of the boiler have been secured. They are in the market for the following second-hand equipment, all of which must be in first-class condition: 28 or 30 inch lathe, cupola, cinder mill, 30-foot span traveling crane, sand blast machinery, air hoist, three pneumatic chipping tools, overhead trolley, 40-inch band saw, saw table, small pony planer, buzz planer, and trimmer. The officers are: F. W. Burnham, president; E. Collopy, vice-president; William Warden, treasurer, and W. N. Barrett, secretary and manager.

The Shelby Foundry Company, Shelby, Ohio, have organized with \$10,000 capital stock. B. P. Pope, John M. Chamberlain, C. Howalski, Frank M. Cobb and W. K. Hopkins are interested. The gentlemen will carry on a foundry business in Shelby and have already secured a location.

The plant of the Pennsylvania Car Wheel Company, in Allegheny, Pa., which has been idle for some time, has resumed operations to nearly full capacity.

Bridges and Buildings.

The Forest City Steel & Iron Company, Cleveland, Ohio, secured the contract for the Rockefeller office building, to be erected on Superior street, that city. The report that the Cambria Steel Company received the contract was erroneous.

Fires.

A small fire did damage to the plant of the Stephens & Westcott Company, manufacturers of architectural iron, Chicago, the loss being estimated at \$3000.

The annealing shop of the Lancaster Malleable Iron Works, Lancaster, N. Y., was destroyed by fire last week, together with the tumbling shop, shipping house and storeroom, entailing a loss of about \$10,000. The company will rebuild at once, as they have a large number of orders on hand.

The tar paper factory of the Buchanan-Foster Company, York, Pa., was destroyed by fire December 28. The loss is placed at \$50,000.

The Gallego Flour Mills, Richmond, Va., were destroyed by fire December 27, with a loss of about \$150,000.

On December 29 fire did \$9000 damage to the Pequonnock Foundry, on East Washington street, Bridgeport, Conn.

The plant of the Specialty Box Company, Newark, N. J., was destroyed by fire December 26. The loss is estimated at \$30,000.

The plate mill of the Glasgow Iron Company, Pottstown, Pa., was destroyed by fire December 26, while closed for the holidays. The loss is about \$30,000. The product of the mill was steel plate for locomotive boilers, and much of it was used by the Baldwin Locomotive Works of Philadelphia. It is probable that the company will rebuild as soon as possible, as they have quite

a number of orders on hand and the product was always in good demand.

The machine shops of the Atchison, Topeka & Santa Fé Railroad, at La Junta, Col., were recently destroyed by fire. The loss is placed at \$50,000.

Hardware.

A New York City publishing house, who give premiums with each subscription received, have just closed a contract with the M. S. Benedict Mfg. Company, East Syracuse, N. Y., for silverware amounting exactly to \$90,625. This is said to be the largest order ever placed by an individual house for this kind of goods. The company are given the entire year of 1904 to fill the order, making equal shipments every day. The same house have also taken from the Benedict Company \$12,000 worth of goods for the holiday trade. This large order, together with other business booked and much prospective trade, means a busy year for the Benedict Company. Employment will be given to 225 men and women. The spoon department will be enlarged by adding a considerable amount of new machinery.

J. A. Harps Mfg. Company, Greenfield, Ohio, manufacturers of the Never Fail oil can, have orders enough ahead to keep them running full for some time. They are installing some new machinery and otherwise increasing their facilities, thus hoping to be able to take care of all orders promptly during 1904.

The Wetmore Glue Tank Company, Toledo, Ohio, are in receipt of a good sized order from Glasgow, Scotland, for glue room specialties made by them, covering their entire line. These specialties are now represented in almost every country where glue is being used.

Miscellaneous.

The American Shipbuilding Company, Cleveland, Ohio, have closed a contract with C. L. Hutchinson of Hutchinson & Co., Cleveland, for a 6800-ton steel ore carrier. The vessel will be of the latest type of ore carriers, designed to accommodate fast unloading machines. The contract specifies that the boat will be ready for delivery by May 1. The vessel will be 436 feet over all, 416 feet keel, 50 feet beam and 28 feet deep. The engines will be of the triple expansion type, and the cylinders 22 x 35 x 58 inches, with 40-inch stroke. Two Scotch boilers, 13 feet 9 inches long and 11 feet 6 inches in diameter, will furnish steam. The steam pressure provided for will be 170 pounds. The furnaces will be equipped with the Ellis-Eaves induced draft. The vessel will have a speed of 12 miles an hour. The 24 hatches will have 12-foot centers, which will permit the fast unloading machines to work to the best advantage.

The Missouri-Kansas Postal Vending Company, Springfield, Mo., have been incorporated under the laws of Missouri, with a capital stock of \$200,000, to manufacture a patented postage stamp vending and money changing machine invented by F. H. Brinkerhoff of Springfield, Mo. The officers elected to serve for the first year are: Charles Champeny, president; Dr. W. P. Patterson, vice-president; Ellis O. Munger, general manager; B. U. Massey, general counsel; W. O. Oldham, treasurer, and F. H. Brinkerhoff, secretary.

The W. C. Jaynes Automobile Company, Buffalo, N. Y., are erecting a two-story factory building and salesroom at 833-835 Main street.

The Marengo Portland Cement Company, recently organized at Detroit, Mich., with a capital stock of \$1,500,000—\$1,000,000 common and \$500,000 7 per cent. cumulative preferred—will build a cement plant of 2000 barrels capacity per day at Marengo, Ind., at an approximate cost of \$300,000. The work of construction will begin immediately and be pushed vigorously until the completion of the plant. The officers of the company are: President, Frank W. Wheeler; vice-president, Geo. L. Holmes; secretary, R. H. Evans, and treasurer, John Lokle.

The recently incorporated Fred. C. Dryer Supply Company, Cumberland, Md., have taken over the mill, mine, factory and railroad supply business of Smith & Dreyer. The company would be pleased to receive catalogues and jobbers' prices from manufacturers.

The Waterloo Threshing Machine Company, Waterloo, Iowa, have completed their new factory building, 100 x 300 feet, and operations will be begun January 1 next with a full force of men.

The Charles Kaestner Mfg. Company, South Bend, Ind., have been incorporated with \$75,000 capital to manufacture vehicles. The incorporators are John G. Lobstein, Jr., Adolph Kaestner and Charles D. Cutting.

The Kelly & Jones Company, Pittsburgh, have secured the exclusive agency of the Onelda combination steel pulley and are sending out to the trade literature describing the advantages of the pulley, as well as specialties manufactured by themselves at their works, Greensburg, Pa., in steam, water and air lines.

The Marlon Motor Car Company have been incorporated at Indianapolis, Ind., with a capital stock of \$60,000 by Robert H. Hassler, J. A. Hittle and I. G. Bosler.

Some little machinery, such as presses, will probably be required by the Sterling Comb Company, Leominster, Mass., who will rebuild their plant which was recently destroyed by fire, as soon as possible. Most of the machinery they use is special and

is built by themselves. The boilers and engines were not injured.

The Bethlehem & Easton Slag Roofing Company have been organized at Easton, Pa., for the manufacture of roofing material from furnace slag. The company have entered into a contract with the Empire Iron & Steel Company for 600 tons of slag, and expect to buy 400,000 tons from the same company next spring.

The old Lamokin car shops at Chester, Pa., are being torn down by the Johnston Frog & Switch Company, who have purchased the buildings. The officials of the company decline to say what they will do with the site, but it is currently reported that a foundry will replace the old shops. The frog and switch company have just completed the most successful year in their history.

As a result of the failure of the Indiana National Bank, at Elkhart, Ind., six manufacturing concerns of that city have been thrown into the hands of receivers, who give the following figures: Elkhart Paper Company: capital stock, \$50,000; liabilities, \$200,000; assets, \$120,000. Buescher Mfg. Company: capital stock, \$60,000; liabilities, \$65,000. Consolidated Paper & Bag Company: capital, \$30,000; liabilities, \$160,000; assets, \$50,000. National Mfg. Company: capital, \$10,000; liabilities, \$200,000; assets, \$75,000. Jewel Furnace Company: capital, \$2500; liabilities, \$2000; assets, \$1400. Acme Cycle Company: assets and liabilities each \$300,000. The Cycle Company and the Buescher Mfg. Company have closed down; the others are being operated by the receivers.

The Midland Metal Works, Hubbard & Co., proprietors, Philadelphia, Pa., will be incorporated January 1 as the Midland Metal Company. As soon as completed they will occupy their new plant, 1427-1433 Catharine street, where they will have increased facilities for the manufacture of brass, bronze and copper goods, to which will be added a fully equipped ornamental and architectural iron working department. The officers are: William H. Hubbard, president; John W. Flanagan, secretary, and C. P. M. Rumford, treasurer.

Charles A. Schieren & Co., New York, have completed the purchase of the property adjoining their plant on Ferry street. It is now thought that the contemplated addition will be built without delay.

The Meriden, Southington & Compounce Tramway Company are planning to build a cable road to the summit of West Peak, which is a considerable elevation near Meriden, Conn.

John Kelly and Thomas McGeavhie, Sandusky, Ohio, are organizing a company among Cleveland people for the manufacture and sale of a steel railway tie, the invention of the above mentioned gentlemen.

The Harmony Burner Company, Marietta, Ohio, have been organized by M. F. Noll, I. M. Butts, J. A. McCormick, Fred. Harmony and others for the purpose of manufacturing a new burner designed for use on heat and steam producing boilers using gas as fuel. The company will establish a factory at Marietta.

The Crest Mobile Company of Cambridge, Mass., have taken the shop buildings formerly occupied by the Damon Safe & Iron Works, on First street. The buildings give them 45,000 square feet of manufacturing space and are admirably adapted for their new purposes. This is the second time the company have moved within a year, each time to much larger quarters. The corporation are organized under Maine laws with a paid in capital stock of \$100,000, the capital having recently been increased from \$50,000. The company have reorganized with the election of these officers: President, H. W. Lamb of Brookline, Mass.; vice-president, I. H. Davis of Dorchester; treasurer and manager, Walter O. Adams of Cambridge; directors, these officers and David A. Ritchie and William Quinby of Cambridge. Messrs. Lamb and Ritchie comprise the Cambridge firm that bear their names.

The Clyde Coal Company, Pittsburgh, Pa., have received a contract for 150,000 tons of soft coal, to be shipped to Park Steel Works, in Pittsburgh, during 1904.

The Waukesha Expanded Metal Company, Waukesha, Wis., have incorporated, to manufacture iron and steel products. The incorporators are T. E. Ryan, C. W. Newburg and Margaret O'Malley, and the capital stock of the new concern is \$40,000.

The plant of the Structural Steel Car Company, Canton, Ohio, which went into the hands of receivers some months ago, was sold at trustees' sale at Canton last week. The application for confirmation of the sale was signed by J. R. Blakeslee and George C. Dewitte of Cleveland. Mr. Blakeslee is president of the Ajax Mfg. Company, manufacturers of forging machinery, but states that the transaction is a personal affair and that his company are in no way identified with it. He declines at this time to state what disposition will be made of the plant. It is understood that the consideration in the sale was \$73,000. The plant is a large one and is equipped with the latest improved machinery for the manufacture of steel cars, and it is said to represent an outlay of \$200,000, together with the value of the patents held by the company. The company were organized two years ago by New York, Chicago and Cleveland people, headed by Harry Guffey of Pittsburgh.

The Niles Car & Mfg. Company, Niles, Ohio, have received an order for 25 street railway cars for the Cleveland Electric Railway Company, to replace in part cars recently destroyed by fire.

The Iron and Metal Trades.

While comparatively little business was done during the past week there have been a very encouraging number of inquiries which indicate that buyers are studying the question of their requirements for next year. In some cases, the quantities called for indicate a somewhat expected falling off as compared with previous years. The next few weeks must tell whether the prices demanded by sellers will meet the views of consumers and dealers and lead to liberal buying or whether the hand-to-mouth policy will be pursued further. No one expects any upward tendency in the principal lines of finished material for the next few months.

The Pig Iron markets are firm in all quarters, but after the heavy tonnage placed there is naturally a lull. Some meetings among the Southern makers are being held at Birmingham, but as yet nothing definite has resulted from them.

In the Steel Rail trade the most interesting event has been the capture by a Western mill against foreign competition of a 30,000 ton order for a Canadian road, the rails to be delivered at Port Arthur. Since the American mill has exceptional advantages over European sellers, in the way of freights, the net price secured by the domestic producer must have been a relatively very favorable one. The weakness in Light Rails continues, but there has been more doing.

There has been a decidedly better demand for Plates, and quite a number of good orders are in the market. While this is encouraging, the capacity available which is unemployed is still quite large.

A slightly better feeling has developed in Bars since the prospect of some good orders is brighter. Sheets, however, are still weak, and concessions are being made.

The leading interest has announced lower prices on Boiler Tubes, the announcement, however, merely meeting openly a condition of affairs which has lasted for some weeks, the competition of the independent mills having been aggressive for some time past.

The condition of the Cast Iron Pipe industry is very encouraging. Some very good contracts have been placed lately, among them a lot of over 8000 tons for a New York interest. The inquiries are heavy; in fact, they are in excess of former records. *

Reports are in circulation concerning large export sales of Billets and Sheet Bars, which, however, will be accepted with reserve.

More business has been done in Old Material, but in many instances at the expense of values. There have been sales aggregating about 6000 tons of Old Steel Rails by an Eastern road, which are to be exported.

The Coke makers have abandoned their efforts to establish a central selling agency.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Dec.30, 1903.	Dec.23, 1903.	Dec.2, 1903.	Dec.31, 1902.
PIG IRON:				
Foundry Pig No. 2. Standard, Philadelphia	\$15.00	\$15.00	\$15.00	\$22.75
Foundry Pig No. 2, Southern, Cincinnati	12.00	12.00	12.00	21.75
Foundry Pig No. 2, Local, Chicago	14.50	14.50	14.50	23.00
Bessemer Pig, Pittsburgh	14.70	14.10	14.85	21.85
Gray Forge, Pittsburgh	13.00	13.00	12.50	20.00
Lake Superior Charcoal, Chicago	16.75	16.50	16.50	25.00

BILLETS, RAILS, &c.:

Steel Billets, Pittsburgh	23.00	23.00	23.00	29.50
Steel Billets, Philadelphia	24.25	24.25	24.25	27.50
Steel Billets, Chicago	24.00	24.00	23.00	29.50
Wire Rods, Pittsburgh	30.00	30.00	31.00	34.50
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL:

O. Steel Rails, Chicago	9.50	9.00	9.00	18.75
O. Steel Rails, Philadelphia	11.50	11.50	11.75	21.00
O. Iron Rails, Chicago	13.00	13.00	13.00	24.00
O. Iron Rails, Philadelphia	14.50	14.50	16.00	24.00
O. Car Wheels, Chicago	13.00	13.00	13.00	24.00
O. Car Wheels, Philadelphia	12.75	12.75	12.75	20.00
Heavy Steel Scrap, Pittsburgh	11.00	11.00	12.00	21.50
Heavy Steel Scrap, Chicago	9.50	9.00	9.00	18.25

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia	1.35	1.35	1.35	1.92
Common Iron Bars, Chicago	1.30	1.30	1.35	1.75
Common Iron Bars, Pittsburgh	1.34½	1.34½	1.34½	1.70
Steel Bars, Tidewater	1.44½	1.44½	1.44½	1.75
Steel Bars, Pittsburgh	1.30	1.30	1.30	1.60
Tank Plates, Tidewater	1.74½	1.78	1.78	2.10
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.75
Beams, Tidewater	1.74½	1.73½	1.73½	1.90
Beams, Pittsburgh	1.60	1.60	1.60	2.00
Angles, Tidewater	1.74½	1.73½	1.73½	1.90
Angles, Pittsburgh	1.60	1.60	1.60	1.90
Skelp, Grooved Iron, Pittsburgh	1.50	1.50	1.45	1.90
Skelp, Sheared Iron, Pittsburgh	1.50	1.50	1.55	1.95
Sheets, No. 27, Pittsburgh	2.25	2.25	2.30	2.65
Barb Wire, f.o.b. Pittsburgh	2.45	2.45	2.50	2.45
Wire Nails, f.o.b. Pittsburgh	1.85	1.85	1.90	1.85
Cut Nails, f.o.b. Pittsburgh	1.90	1.90	1.90	2.05

METALS:

Copper, New York	12.37½	12.37½	12.12½	11.87½
Spelter, St. Louis	4.65	4.65	4.50	4.35
Lead, New York	4.25	4.25	4.10	4.10
Lead, St. Louis	4.17½	4.17½	4.00	3.97½
Tin, New York	28.00	28.50	25.80	26.50
Antimony, Hallett, New York	6.25	6.25	6.25	7.12½
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.79	3.79	3.79	3.79

Chicago.

FISHER BUILDING, December 30, 1903.—(By Telegraph.)

The decision of the powers that be to stand pat on present prices has had the desired effect. Buyers who persistently held off, frequently to their inconvenience and discomfort, are now coming into the market with tonnages sufficient to give them good working stocks. The strengthening of Southern Pig Iron prices has helped this feeling of confidence. Buyers have been holding off, not so much because they thought that Iron and Steel prices were too high, but rather because they feared that if they bought, their competitors might be able to get in at lower prices. Now that they know what the prices are, both to themselves and to their competitors, their policy of picking up current necessities from hand to mouth is gradually giving way to a normal buying movement. On every hand the feeling is better than it has been for six weeks, and the new year is looked forward to with agreeable anticipations, in spite of the unfavorable forecast of Farmer Benner, which, by the way, is creating wide comment. No one expects that 1904 will be a boom year, and, indeed, the average manufacturer would rather it would not be a boom year, because the largest profits are not always made under boom conditions. The only marked change in price is a lowering of the published price on Boiler Tubes on the part of the leading producer, although this selling price has doubtless been made by this producer for some time to some customers when necessary to meet competition of independent mills. Pig Iron is stronger in tone, though we do not increase prices, except in the case of Lake Superior Charcoal and Southern Silveries. The renewed activity of leading railroads in placing orders for cars, as published elsewhere in this issue, has led to a strengthening in the tone of Plates and Bars par-

ticularly. Sheets show no particular strength, although they may be called slightly stronger than last week. A noteworthy sign of the times is the fact that the great State street department stores were literally overwhelmed with holiday trade, the sales exceeding even the phenomenal figures of last year by an average of 20 per cent.

Pig Iron.—Southern Iron on the basis of \$9.50, Birmingham, for No. 2, is hard to get, though some interests are still quoting that price to favored customers for immediate acceptance or in the way of extensions on previous orders. Much new business is taken at \$9.75 and \$10, Birmingham, for delivery in January. One leading producer has notified its representative that in January its price would be increased to \$10.50 for No. 2 and \$10 for No. 3. At the price of \$10, Birmingham, for No. 2 Southern, or \$13.85, Chicago, Northern Iron will begin to come into the market, as the average consumer is willing to pay about \$1 per ton more for Northern than for Southern Iron in this market. Northern No. 2 is still quoted on the basis of \$14.50, delivered consumers' tracks. While no large orders either for Northern or Southern Iron are noted, it is estimated that there has been twice as much Iron shipped in the last ten days as the furnaces now in blast produce. In other words, stocks at furnaces are being rapidly reduced. This is particularly true of the Southern furnaces. Few Southern furnaces are willing to take business beyond March at any price. We quote:

Lake Superior Charcoal.....	\$16.75 to \$17.25
Northern Coke Foundry, No. 1.....	15.00 to 15.50
Northern Coke Foundry, No. 2.....	14.50 to 15.00
Northern Coke Foundry, No. 3.....	14.00 to 14.50
Northern Scotch, No. 1.....	15.50 to 16.00
Ohio Strong Softeners, No. 1.....	16.80 to 17.30
Ohio Strong Softeners, No. 2.....	16.30 to 16.80
Southern Silvery, according to Silicon.....	15.35 to 16.35
Southern Coke, No. 1.....	13.85 to 14.35
Southern Coke, No. 2.....	13.35 to 13.85
Southern Coke, No. 3.....	12.85 to 13.35
Southern Coke, No. 4.....	12.35 to 12.85
Southern Coke, No. 1 Soft.....	13.85 to 14.35
Southern Coke, No. 2 Soft.....	13.35 to 13.85
Foundry Forge.....	12.35 to 12.85
Southern Gray Forge.....	12.10 to 12.60
Southern Mottled.....	12.10 to 12.60
Alabama and Georgia Car Wheel.....	20.85 to 21.85
Malleable Bessemer.....	14.50 to 15.00
Standard Bessemer.....	16.30 to 16.80
Jackson County and Kentucky Silvery,	
6 to 10 per cent. Silicon.....	18.30 to 19.30
Basic Southern.....	13.85 to 14.10

Bars.—The renewed activity on the part of car builders, owing to recent contracts placed for cars by Western railroads, is helping the Bar market. Iron is strong, the bulk of the business being done on the basis of 1.35c. to 1.40c., with few quotations of 1.30c. still open. Bar Steel shares in the activity, and liberal specifications, compared with the last few weeks, are being received from the agricultural implement interests. The Hoop business, too, is a little more active than it has been for some weeks. We quote: Bar Iron, 1.30c. to 1.40c., base, half extras; Bar Steel, 1.46½c. to 1.51½c., base, half extras, with quarter extras for rounds and squares larger than base; Hoops, 1.81½c. to 1.91½c. rates, in carload lots, with 10c. advance for less than cars; Small Angles, Beams, Channels and Zees, 1.56½c. to 1.66½c., base, half extras; Small Tees, 5c. advance; Hard Angles, Channels and Zees, 1.20c. to 1.25c., flat. Store business, while light, is better than was expected for the holiday week. Steel Bars sell at 1.65c. to 1.75c. to the ordinary consumer, with here and there sales at 1.60c. to the large buyer. Iron Bars are sold at about the same range, the difference being that Iron Bars are sold on full extras and Steel Bars at half extras. Hoops from store sell at 2.10c. to 2.25c. rate, full extras.

Structural Material.—This is an off week in the Structural trade as far as actual business taken, but inquiries are coming in in greater volume than for some time. Structural Shapes are still quoted at 1.76½c., Chicago, for I-Beams and Channels up to and including 15 inches and for Angles 3 inches on one leg and over, with \$1 per ton extra for Tees 3 inches and larger. Structural offered from store at from 1.90c. to 2c., cut to lengths 5 feet and over. Large warehousemen are able to get the higher prices named on all ordinary lots, the lower prices named being only to meet competition on business for some magnitude.

Plates.—The recent orders for several thousand cars for Western roads and the inquiries on the part of other railroads that will buy many thousand cars have led to a strengthening in the Plate market. The fact that the new method of selling Plates on the basis of 1.60c., Pittsburgh, plus full freight, will not take effect until January 1 has led buyers in Chicago, Milwaukee and other territories where the new schedule will mean an increase in cost to anticipate their needs heavily by ordering large tonnages on the old Plate schedule. Prices beginning January 1 are as follows: Tank Steel, ¼-inch and heavier, 1.76½c. to 1.86½c.; Flange, 1.86½c. to 1.96½c.; Marine, 1.96½c. to 2.06½c.; Universal Mill Plates, 1.76½c. to 1.86½c. Jobbers with large stocks of Boiler Plate in store are enjoying almost their usual vigorous midwinter trade, as this is distinctively the boiler season. We quote from store: One-

quarter inch and heavier Tank Steel is sold at 2c., 3-16 inch at 2.10c., Nos. 8 and 10 at 2.15c., with 25c. extra for Flange quality.

Boiler Tubes.—A liberal reduction has been announced in the price of Boiler Tubes by the leading producer. It is thought, however, that this, rather than a new cut of prices, is in the nature of a confirmation of reduced prices that have been in existence for some time. By comparing the following list with the prices published last week it will be seen that the increase in discounts ranges from 1½ to 4 per cent. It will be noted that a new grouping of sizes has been made, throwing the 2½ inch diameter into a group by itself. No reduction has been announced on the price of Seamless Steel Tubes as yet. We quote the following discounts for carload lots, f.o.b. Chicago, in which 1.65 per cent. has been subtracted from the new Pittsburgh basing discount to take care of the 16½c. freight on carload lots of Boiler Tubes from Pittsburgh to Chicago:

	Discounts, per cent.		
	Steel.	Iron.	Seamless steel.
1 to 1½ inches.....	42.35	38.85	53.35
1½ to 2½ inches.....	54.85	37.35	40.35
2½ inches.....	57.45	42.35	up to 4 in.
2½ to 5 inches.....	63.35	49.85	48.35
6 to 13 inches.....	54.85	37.35

Warehousemen report trade active on Boiler Tubes, and they also announce a cut in price, in which they give 2½ per cent. better discount than formerly on the 2½ to 5 inch sizes only, in both Steel and Iron, with no change in their price on Seamless Steel. Discounts are now as follows:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches.....	40	35	37½
1½ to 2½ inches.....	50	32½	35
2½ to 5 inches.....	60	45	45
6 inches and larger.....	50	32½	..

Sheets.—No two Sheet mills quote the same prices, each following a system of differentials of its own. Business is improving somewhat, and the outlook for renewed activity in January is considered bright. The Inland Steel Company are again rolling Sheets of all gauges. A fair average of the prices on Sheets in the Chicago market in carload lots is as follows: No. 10, 1.91½c. to 1.96½c.; No. 12, 1.96½c. to 2.01½c.; No. 14, 2.01½c. to 2.06½c.; No. 16, 2.11½c. to 2.16½c.; Nos. 18 and 20, 2.16½c. to 2.26½c.; Nos. 22 and 24, 2.26½c. to 2.36½c.; No. 26, 2.36½c. to 2.41½c.; No. 27, 2.41½c. to 2.46½c.; No. 28, 2.46½c. to 2.51½c. The low prices named are only on very large lots for nearby delivery. Store business is fairly active, prices remaining unchanged as follows: Nos. 8 and 10, 2.15c. to 2.20c.; No. 12, 2.20c. to 2.25c.; No. 14, 2.30c. to 2.35c.; No. 16, 2.40c. to 2.45c.; Nos. 18 and 20, 2.55c. to 2.60c.; Nos. 22 and 24, 2.65c. to 2.70c.; No. 26, 2.75c. to 2.80c.; No. 27, 2.85c. to 2.90c.; No. 28, 2.90c. to 3c. Buyers of Galvanized Sheets are beginning to respond to the lower prices made last week, the present figures being on the basis of 80 to 80 and 2½, Pittsburgh, plus full freight, in carload lots, Galvanized Sheets from store selling at from 75 and 5 to 75 and 7½ discount.

Billets.—No orders of any magnitude have been taken and no large inquiries are at hand, though there is a fairly active demand for Forging Billets on the part of local forge shops. Producers expect that early in January a greatly increased trade will be in evidence, as they are of the opinion that Billet users have practically no stocks on hand. We quote in carload lots, Billets for either forging or rolling, either Bessemer or Open Hearth quality, \$24 per gross ton, Chicago.

Merchant Pipe.—The year just closed has been a phenomenal one for producers of Merchant Pipe, and no member of the Iron and Steel family maintained its strength throughout the whole season as well as this product. Even during the last six weeks, when other Iron and Steel products were in the dumps, Pipe has been more active than the season and general conditions would apparently justify. Official prices named by the leading producer are as follows:

	Steel Pipe.		Guaranteed Wrought Iron.	
	Black.	Galvd.	Black.	Galvd.
Per cent. Per cent. Per cent. Per cent.				
¼ to ¾ inch.....	66.35	56.35	63.35	53.35
¾ inch.....	68.35	58.35	65.35	55.35
¾ to 6 inches.....	73.35	63.35	70.35	60.35
7 to 12 inches.....	67.35	57.35	64.35	54.35
Less than carloads, 12½ per cent. advance.				

It is generally acknowledged, however, that better prices are being made by independent mills, particularly for Western shipment, where the Western mills enjoy the advantage of the difference in freight between Chicago and Pittsburgh. Some independent mills are said to be offering Wrought Pipe at the same discounts as Steel Pipe.

Cast Iron Pipe.—Some little activity is noted in business of a small character, but, as usual at this time of year, few orders of any magnitude have been taken. Official prices remain at \$27.50 to \$28 for 4-inch, and 50c. less for 6-inch Water Pipe and \$1 per ton higher for Gas Pipe. Concessions are made in instances where large tonnages are involved.

Rails and Track Supplies.—The Rail business is quiet this week, though a number of large inquiries are in the market and it looks as though a considerable tonnage would be placed early in January. Standard Sections are still quoted at \$28 and Light Sections show some strength, the minimum prices for 20 to 40 lb. being about \$26, with 16-lb. \$27, 12-lb. \$28 and 8-lb. about \$29 to \$30. Light Rails from stock are sold at 1.60c. per lb., f.o.b. warehouse, in car lots or less, by the leading interest, though other dealers are selling certain Light Sections at lower prices. We note no changes in the price on Track Supplies, which are quoted as follows: Angle Bars, 1.45c. to 1.55c.; Spikes, 1.80c. to 1.90c., base; Track Bolts, 2.50c. to 2.60c., base, with Square Nuts, and 10c. to 15c. advance for Hexagon Nuts.

Merchant Steel.—Specifications continue to come in with good activity and it is thought that shipments in January will be very large, as implement manufacturers have been holding off so long that their stockrooms are practically empty. Prices remain unchanged, as follows: Open Hearth Spring Steel to the general trade, 2c. to 2.25c.; Smooth Finished Machinery Steel, 1.71½c. to 1.81½c.; Smooth Finished Tire, 1.66½c. to 1.76½c.; Sleigh Shoe, 1.51½c. to 1.61½c.; Cutter Shoe, 2.25c. to 2.35c.; Crucible Tool Steel, 6½c. to 8c.; Special Tool Steel, 12c. up; Shafting at 52 per cent. in car lots and 47 per cent. in less than car lots; Toe Calk Steel, 2.01½c. to 2.11½c.

Old Material.—A small flurry of activity is noted among dealers, who are anxious to keep business moving during this season of snow and cold, but mills and furnaces show little disposition to increase their purchases in number or in amount of tonnage. The stronger feeling which is evident has given rise to a few slight advances in price. We quote as follows per gross ton, Chicago, in car lots:

Old Iron Rails.....	\$13.00 to \$14.00
Old Steel Rails, 4 feet and over.....	11.00 to 11.50
Old Steel Rails, less than 4 feet.....	9.50 to 10.00
Heavy Relaying Rails, subject to inspection.....	22.50 to 23.50
Heavy Relaying Rails, for side tracks.....	18.00 to 20.00
Old Car Wheels.....	13.00 to 13.50
Heavy Melting Steel Scrap.....	9.50 to 10.00
Mixed Steel.....	8.00 to 9.00
Mixed Country Steel.....	7.50 to 8.00

The following quotations are per net ton:

Iron Fish Plates.....	\$12.00 to \$12.50
Iron Car Axles.....	14.75 to 15.25
Steel Car Axles.....	12.50 to 13.00
No. 1 Railroad Wrought.....	10.00 to 10.50
No. 2 Railroad Wrought.....	9.00 to 9.50
Shafting.....	13.00 to 13.50
No. 1 Dealers' Forge.....	8.75 to 9.00
No. 1 Busheling and Wrought Pipe.....	8.00 to 8.50
Iron Axle Turnings.....	7.50 to 8.00
Soft Steel Axle Turnings.....	7.50 to 8.00
Machine Shop Turnings.....	7.00 to 7.25
Cast Borings.....	3.50 to 4.00
Mixed Borings, &c.....	3.50 to 4.00
No. 1 BOLLERS, cut.....	8.50 to 9.00
Heavy Steel Scrap.....	10.00 to 11.00
Stove Plate and Light Cast Scrap.....	8.50 to 9.00
Railroad Malleable.....	8.50 to 9.00
Agricultural Malleable.....	8.00 to 8.50

Metals.—The only change since last week's prices is a further advance in Pig Tin, which is now quoted 30c. to 30½c. No great activity is found in the market this week, though none is expected for the last week of the year. We quote: Casting Copper is offered at 12½c. to 13¼c.; Lake, ¼c. higher. Lead in 50-ton lots shows an advance of 15c., being now quoted at 4.20c.; car lots at 4.25c.; less than car lots at 4.40c. Spelter remains at 4¾c. in car lots and 5c. in less than car lots. Sheet Zinc is offered at 5.65c., Chicago, in 600-lb. casks, with the usual advances for smaller casks. Pig Tin has increased to 30c. to 30½c. for the present market. Old Metals are steady, and, with the exception of Red Brass, which has advanced ¼c., quotations are as last given. Heavy Cut Copper sells at 10¾c., Copper Bottoms at 10c., Red Brass at 10c., Lead at 3.85c., and Zinc at 3.50c., spot.

Tin Plate.—Tin Plate is still quoted at \$3.60, Pittsburgh, or \$3.79, base, Chicago, notwithstanding the repeated advances in Pig Tin. The leading maker is said to be sold up to April, and independent producers are advising their customers to make immediate specification in order to secure anything like prompt delivery. Buying in this commodity has been delayed to such an extent by consumers large and small that should anything happen to stampede them into the market at one time the mills would be powerless to make prompt deliveries.

Coke.—Weakness follows weakness in this market, and first-class 72-hour Connellsville Foundry Coke is now being offered at from \$5.05 to \$5.25 per ton, with some producers willing to deliver a 72-hour Connellsville Coke at \$4.85.

The Abrasive Material Company will open a branch store at 54 West Randolph street, Chicago, about January 1. They intend to carry a stock of their Abrasive emery wheels, thus enabling them to make prompt shipments to their many customers in that territory.

Philadelphia.

FORREST BUILDING, December 29, 1903.

There has been no business of any account during the past week. Prices of Pig Iron are steady and unchanged, but there is very little buying, and it looks as though there would be something of a pause until it is seen what the new year will develop. There is plenty of talk of good things to come, but it will have very little effect until something tangible is obtained by the mills and foundries. The next few weeks will no doubt test the situation very thoroughly, which at the moment is somewhat problematical. Prices of Pig Iron (as far as regards improvement) depend upon the amount of business that will come in during January and February. November and December proved to be better than was expected, but order books are not sufficiently covered to avoid reaction, unless the demand is at least fairly active. The outlook is not very clear, and as the trade recognizes this feature, they are disposed to go slow until they feel sure of their position. During the past week there has not been a single change worth noting. Prices, as we said before, are firm and unchanged, but there has been very little business since date of our last report. There is a good inquiry for Billets and Sheets, with prospects of some fair sized orders being taken after the turn of the year. Scrap is also a trifle firmer, and holders expect to get more money than could be obtained during the past few weeks.

Cincinnati.

FIFTH AND MAIN STS., December 30, 1903.—(By Telegraph.)

The holiday spirit is having its effect upon the Pig Iron market, and business as a consequence has been rather light throughout the past week. Nothing more active is looked for during the present week. During the past week, however, there has been quite a little sprinkling of Iron sold, the Southern brands mainly in evidence. Northern Irons are still rather quiet, though perhaps showing more tendency to activity than they have been doing recently. Almost all of the Southern business has been done on the basis of \$9.50, Birmingham, for No. 2 Foundry, most of this for the first quarter of next year. A few sales on the basis of \$9.25 are also reported, though the amount of Iron actually for sale at this price is believed to be small; yet the report of occasional dates has just enough effect on the situation to keep it from being said that the market is firm at \$9.50. There is a report here in effect that an effort is being made at Birmingham to revive the Southern Association. No one appears to know just what value to give these rumors, but it is supposed that within the next few days something definite one way or the other will be heard by agents here. The general situation, while fairly firm in tone, does not appear to be changed materially from what it was a week ago. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$12.50 to \$13.25
Southern Coke, No. 2.....	12.00 to 12.75
Southern Coke, No. 3.....	11.50 to 12.25
Southern Coke, No. 4.....	11.00 to 11.75
Southern Coke, No. 1 Soft.....	12.50 to 13.25
Southern Coke, No. 2 Soft.....	12.00 to 12.75
Southern Coke, Gray Forge.....	10.75 to 11.25
Southern Coke, Mottled.....	10.75 to 11.25
Onio Silvery, No. 1.....	17.65 to 18.15
Lake Superior Coke, No. 1.....	15.15 to 16.15
Lake Superior Coke, No. 2.....	14.65 to 15.65
Lake Superior Coke, No. 3.....	14.15 to 15.15

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$20.00 to \$21.00
Lake Superior Car Wheel and Malleable.....	19.00 to 20.00

Plates and Bars.—The general situation is thought by dealers here to be showing continued improvement. Wholesalers are reporting a much better contract business, extending into the next year, than they were enjoying a few weeks ago. Trade from store just now is a little bit quiet, largely due to the season. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.35c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, carload lots, 1.43c., with half extras; the same in small lots, 1.80c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.70c., in carload lots; in smaller lots, 2c.; Sheets, 16 gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; 14 gauge, in carload lots, 1.95c.; in smaller lots, 2.50c.; Steel Tire, ¾ x 3-16 and heavier, 1.63c., in carload lots.

Old Material.—So little Old Material is changing hands that quotations given herewith are mainly nominal, though they represent the general idea as to value. We quote dealers' buying prices, f.o.b. Cincinnati as follows: No. 1 Wrought Railroad Scrap, \$10 per net ton; No. 1 Cast Scrap, \$10 per net ton; Iron Rails, \$13 to \$14 per gross ton; Steel Rails, rolling mill length, \$10 per gross ton; Iron Axles, \$15 per gross ton; Car Wheels, \$11 per gross ton; Heavy Melting Scrap, \$9.75 to \$10 per gross ton; Low Phosphorus Scrap, \$11.50 to \$12 per gross ton.

Cleveland.

CLEVELAND, OHIO, December 29, 1903.

Iron Ore.—The attitude of the Ore shippers and producers has changed on the matter of fixing prices for the coming year. The present understanding is that there will be no discussions until very late in the spring, and it may be even later than it was last spring before the prices are fixed for the coming season. This is, in part, due to the uncertainty as to the future of the Steel trade, and likewise to the knowledge that there is enough Ore down the lakes to last for many months. The lake vessel interests are already talking of an agreement to hold their boats in port until June 1, which is having an effect upon the action of the Ore shippers.

Pig Iron.—The usual holiday dullness has shown itself. With an improvement in the situation in the South and a consequent easing of the conditions for Northern stacks, it seemed likely that the market would continue to improve, but, on the contrary, prices have softened on all grades. The latest estimate, made by careful Pig Iron men, is that the consumption in Cleveland is now 50 per cent. of that of a year ago. In a few instances the foundries are beginning to melt a little more Iron than they did, but the larger part of the trade is yet to show any signs of improvement. It is now appreciated that the opening of new furnaces in this territory during the spring and summer had much to do with overstocking the market, and the result is that the Northern supply is in excess of the demand, giving occasion for a further curtailment of production. We quote, f.o.b. cars Cleveland:

Northern Coke, No. 1 Foundry.....	\$14.50 to \$15.00
Northern Coke, No. 2 Foundry.....	14.00 to 14.50
Northern Coke, No. 3 Foundry.....	13.50 to 14.00
Southern Coke, No. 1 Foundry.....	14.25 to 14.50
Southern Coke, No. 2 Foundry.....	13.75 to 14.00
Southern Coke, No. 1 Soft.....	14.25 to 14.50
Southern Coke, No. 2 Soft.....	13.75 to 14.00
Jackson County, 8 per cent. Silicon....	17.45
Hanging Rock Charcoal, No. 1.....	23.45
Southern Charcoal, No. 1.....	20.00 to 20.50
Lake Superior Charcoal.....	18.00 to 18.50

There is little or no demand for Bessemer or Basic, with the exception of now and then a little call for Bessemer Malleable. This is being offered delivered at lower prices, and consumers are disposed to wait. The Coke situation is much easier. Good 72-hour Coke is selling at from \$2.25 to \$2.50 a ton at the oven, while the high sulphur Cokes are ranging from \$2 to \$2.10 at the oven.

Finished Iron and Steel.—The Steel trade shows some hesitancy on the part of consumers of Structural and Plates, because of the failure to make a reduction of prices. Some of the consumers in Western Ohio are making vigorous objection to the change of basis by which Structural Steel is quoted 1.60c., Pittsburgh, plus freight to destination, instead of 1.75c. flat to all Ohio points. In Bars there is much talk of a higher price for Bar Iron. It is now declared to be imperative either to advance the price of Finished Material or to lower the price of Scrap and labor, but especially of Scrap. The tendency in the latter trade is to advance, and consequently the mills are about to agree on a higher price for their material. As it is, the decline has been checked, and all quotations are on the basis of 1.30c., Youngstown, with some possibility that the new quotation will be 1.35c., Youngstown. The buying of Bar Steel has improved. The consumers who have not contracted for their supply are coming in, and those who have contracts continue to specify against them rather heavily. The tendency of the whole trade is upward. Steel prices hold firm at 1.30c., Pittsburgh, for Bessemer, and 1.40c., Pittsburgh, for Open Hearth. In Sheets there is a slight tendency to improve. Consumers have not yet begun to contract for the coming year's supply, but their inquiries are in and they are showing some interest in the status of the trade. The independent concerns, if the reports are to be relied upon, are making considerable concessions to get business. The buying out of stock continues to be the heavy part of the business. Prices are unchanged, as follows: No. 27 Black Sheets, out of stock, 2.50c.; No. 27 One Pass Cold Rolled, in car lots, at the mill, 2.35c.; Calvanized Sheets, No. 22 and lighter, 75, 10 and 2½ off list, out of stock, and for lighter gauges 75 and 10 off list. The Rail trade has not improved. Electric lines have come into the market from time to time for small amounts of material, but any extensive movement has been checked by lack of funds. The demand for Billets seems to have improved ever so slightly, but the reaffirmation of prices did not improve the situation much for the association mills, merely assuring the independents a better grip on the market with their reduced prices. The price holds nominally at \$23.50, Cleveland, for Bessemer 4 x 4.

Old Material.—The Scrap trade does not improve. Speculation has been so extensive among the dealers that many of the smaller ones are finding themselves loaded with material which is depreciating in value, causing a desire to unload, which, in turn, is producing lower prices. The market holds nominally as follows, all gross tons: Old Steel

Rails, \$14 to \$15; Old Iron Rails, \$16; Old Car Wheels, (nominal), \$13.50 to \$14; Railroad Malleable, \$13; Cast Borings, \$4. All net tons: No. 1 Railroad Wrought, \$11 to \$12; No. 1 Busheling, \$9.50 to \$10; Wrought Turnings, \$6; Iron Car Axles, \$17 to \$18 (nominal); No. 1 Cast Scrap, \$10.50 to \$11.50; Stove Plate, \$9.

Pittsburgh.

PARK BUILDING, December 30, 1903.—(By Telegraph.)

Pig Iron.—The market on Pig Iron is extremely quiet, and very little tonnage is changing hands. At the present time more than 60 per cent. of the blast furnaces in the Pittsburgh, Mahoning and Shenango Valley districts are idle, and the output of Iron for December will show a large falling off as compared with November. The price of Bessemer Iron is difficult to quote, as there is so little selling. It has been offered as low as \$13.25, Valley furnace, or \$14.10, Pittsburgh. To some furnaces that are using Ores at high cost and high price Coke this price of Iron is positively below cost of production. Forge Iron is quiet, and Northern brands are held at \$13 to \$13.25, Pittsburgh. Foundry Iron is fairly firm, Southern No. 2 being held at \$9.50, Birmingham, or \$13.85, Pittsburgh. Northern makes of No. 2 Foundry are held at \$14 to \$14.35, Pittsburgh.

Steel.—Reports that three or four concerns have withdrawn from the Billet Association and were offering Steel at several dollars a ton below the official price are denied. Only one small Eastern Open Hearth plant withdrew, and this concern uses most of its Steel in its own finishing mills. It is claimed that the Billet Association is in better shape in every way than at any time since it was organized. We quote Bessemer and Open Hearth Billets at \$23, Pittsburgh, with \$1 a ton advance for Sheet Bars in long lengths.

Coke.—The project to put the Coke trade on a better basis by selling the output of the ovens through a central selling agency has been abandoned. There were so many interests to conciliate and such a large output of Coke to take care of, that it was found the plan proposed was not feasible. Some low prices are now being made on Coke, and to some new plants in the region these are undoubtedly below actual cost of production. Strictly Connellsville Furnace Coke has been sold as low as \$1.45 a ton, at oven, for delivery in the next month or two. The large Coke interests, however, will not agree to take contracts for extended delivery at this low price. They are quoting \$1.60 to \$1.65, at oven.

Ore.—Last year about 27,000,000 tons of Ore were brought down, and this year about 24,000,000 tons. The outlook is that next year the amount of Ore to be brought down will not exceed 18,000,000 tons, and it may be less. The Ore docks at all the lower lake ports are congested with Ore, and this will have to be moved before any more can be brought down. For this reason it is not probable that some of the large interests will bring any Ore down before May or June of next year.

(By Mail.)

The closing week of the year finds the Iron trade rather quiet, and nothing of importance has developed since our last report. We may state that a very much better feeling pervades in the trade and a material increase in tonnage is expected early in the new year, when inventory and repairs, now being made at many of the mills, have been completed. An encouraging feature of the situation is that the Carnegie Steel Company are preparing to start up a number of their blast furnaces in Pittsburgh and other districts that have been idle for some little time. Reports that the official price of \$23, Pittsburgh, for Bessemer and Open Hearth Steel is being shaded \$2 a ton by outside mills is firmly denied. It is admitted that only a small tonnage of Steel is being sold at pool prices, but this is for the reason that most consumers are covered by sliding scale contracts, which give them their Billets and Sheet and Tin Bars at prices somewhat lower than the open market. Demand for Finished Iron and Steel is rather quiet, but the tone of the market is fairly firm. Manufacturers of Wire and Wire Nails expect a heavy increase in tonnage shortly after the first of the year, and the market on these products is rather firm at the recently adopted prices. In fact, it would not be surprising to the trade were a slight advance in prices made in Wire and Wire Nails early in the new year.

While nothing definite has been accomplished by the committee appointed some time ago by the Coke operators, a meeting of this committee is being held to-day, and it is expected that some plan will be announced by which it is hoped to put the Coke business on a better basis and to control prices. It is the general belief that if anything is done it will be in the nature of a pool arrangement, and the output of the ovens will be sold by a Central Selling Agency and at uniform prices.

Ferromanganese.—The market continues very quiet and we continue to quote Domestic, 80 per cent. Ferro, at \$46 in 50-ton lots and over. On large lots and extended delivery this price would likely be shaded. For carloads and smaller lots \$47 to \$48 is quoted.

Rails.—The market continues very quiet and no large orders have been placed. We quote at \$28 at mill for Standard Sections. It is probable that a meeting of the mills rolling Light Rails will be held in Pittsburgh early in January for the purpose of adopting uniform prices, if possible. For some time Light Rails have been selling at lower prices than Standard Sections.

Plates.—A really better demand is reported for Plates, but many of the larger mills are still short of tonnage and are running only partly full. It is believed that demand for Plates will improve after January 1. Official prices are as follows: Tank Plate, $\frac{1}{4}$ -inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches in width, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, \$2 extra; gauge Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Sheets.—The Sheet market continues quiet and prices are rather weak. It is expected that after January 1 demand will show improvement, as some large inquiries are in the market, but buyers are very slow in taking hold. The Amalgamated Association has voted in favor of the 10 per cent. reduction in wages in union Sheet mills, and it goes into effect on January 1. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.25c. to 2.30c., and No. 28 at 2.30c. to 2.35c.; Galvanized Sheets continue to be quoted in a general way at 80 per cent. off in carloads at mill, but on desirable orders 80 and $2\frac{1}{2}$ per cent. is made. In net prices the 80 per cent. discount is equal to 3.20c. for No. 27, 3.40c. for No. 28 and 3.80c. for No. 29. Jobbers charge the usual advances over above prices for small lots.

Structural Material.—No large contracts have been placed since our last report. A great many small orders are being placed which foot up considerable tonnage. We understand that the Union Depot in Washington, to be built jointly by the Pennsylvania and B. & O. railroads, will not be given out for some time. It will not require over 8000 tons of Steel. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

Iron and Steel Bars.—A moderate amount of new tonnage is being placed and some fair sized contracts for extended delivery have been given to the mills, and specifications on these are coming in quite freely. The situation in Bars is better than for some time, and a still further increase in tonnage is expected early in the new year. We quote Iron Bars in carloads at 1.30c., Youngstown, or 1.34 $\frac{1}{2}$ c., Pittsburgh. For very desirable specifications and for a large contract, it is possible this price might be slightly shaded. We quote Steel Bars at 1.30c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs. and not less than 1000 lbs the price is 1.40c., and for less than 1000 lbs. the price is 1.50c.

Muck Bar.—We note a sale of 250 tons of domestic Muck Bar at \$24.50, Pittsburgh. We quote the market on best grades at \$24.50 to \$25, delivered.

Hoops and Bands.—The demand is fairly active, and official prices are being fairly held. We quote Bands at 1.30c., extras as per Steel Card, and Hoops at 1.65c. The price of Cotton Ties for next season has not yet been fixed.

Rods.—A local interest is in the market for 1000 tons of Bessemer Rods for early delivery. We quote Bessemer and Open Hearth Rods at \$30, Pittsburgh.

Railroad Spikes.—Demand is fairly large, and prices are firm on the basis of \$1.85 per 100 lbs.

Tin Plate.—Some large inquiries for Tin Plate for delivery in first quarter of next year are in the market, and we understand a portion of this business has been placed. We quote 100-lb. Cokes at \$3.60, Pittsburgh.

Spelter.—The market is a little firmer, and prime grades of Western Spelter are held at 4.75c. to 4.80c., Pittsburgh, for prompt delivery. Futures are quoted a little lower.

Merchant Steel.—There is more activity in the market, and actual tonnage being placed is larger than for some time. Prices are firmer, and the general tone of the market is strong. We quote: Tire Steel, 1.50c., base, for usual sizes; Toe Calk, 1.85c., base; Sleigh Shoe Steel, 1.45c. to 1.50c.; Open Hearth Spring, 1.90c. to 2c.; Cutter Shoes, tapered and bent, 2.25c. The above prices are for carload lots at mill, the usual differentials being charged for small lots. Tool Steel is 6c. to 8c. for ordinary grades. Prices on Shafting are firm on the basis of 52 per cent. off in carloads and 47 per cent. in less than carloads, delivered in base territory.

Skelp.—While a good deal of inquiry is in the market, we understand that very little tonnage has been actually placed.

We quote Grooved and Sheared Iron Skelp at 1.50c., Pittsburgh, and this seems to be the minimum of the market.

Merchant Pipe.—As intimated in this report last week would be the case, prices on Merchant Pipe have been revised on a somewhat lower basis. Demand is fairly good, considering the season of the year, and the leading mills have a fair amount of tonnage on their books. The new discounts to consumers in carloads just issued are as follows:

	Steel.		Iron.	
	Black.	Galvanized.	Black.	Galvanized.
1, $\frac{1}{2}$ and $\frac{3}{4}$ inch.....	70	60	67	57
$\frac{1}{2}$ inch.....	73	63	70	60
$\frac{3}{4}$ to 6 inches.....	77	67	74	64
7 to 12 inches.....	71	61	68	58
Extra Strong, Plain Ends:				
$\frac{1}{2}$ to 8 inches.....	69	59	65	55
Double Extra Strong, Plain Ends:				
$\frac{1}{2}$ to 8 inches.....	61	51	57	47

Boiler Tubes.—As noted last week, a reduction in price of Boiler Tubes has been made, new discounts to consumers in carloads being as follows:

	Steel.	Iron.
1 to $1\frac{1}{2}$ inches.....	42 $\frac{1}{2}$	39
$1\frac{1}{2}$ to $2\frac{1}{4}$ inches.....	55 $\frac{1}{2}$	38
$2\frac{1}{4}$ inches.....	58	43
$2\frac{1}{4}$ to 5 inches.....	64 $\frac{1}{2}$	50 $\frac{1}{2}$
6 to 13 inches.....	55 $\frac{1}{2}$	38

Coke.—The Coke market continues to lag, both as regards demand and prices. Out of 22,736 ovens in the Connellsville region proper, only 9960 were active last week and 13,076 were idle. The output was 103,696 tons. In the Lower Connellsville region there are 5356 ovens, of which 3933 were active and 1423 idle last week, the output being 41,167 tons. It is said a few contracts for strictly Connellsville Furnace Coke have been made on the basis of \$1.60 a ton, at oven, for delivery in first six months of 1904. Several other contracts for Furnace Coke have been made with Valley furnaces on an exchange basis, so many tons of Coke being given for 1 ton of Iron. Strictly Connellsville 72-hour Foundry Coke is held at \$2.25 to \$2.50 a ton, at oven. Main Line Coke is being offered as low as \$1.40 a ton for Furnace and \$2 a ton for Foundry.

J. E. Wright, formerly president, and T. D. Prosser, formerly chief clerk, of La Belle Iron Works, Steubenville, Ohio, have organized the J. E. Wright Company, with offices in the National Exchange Bank Building, Wheeling, W. Va., and have associated themselves for the purpose of buying and selling Iron and Steel, Coal and Coke, Cement, Brick, &c.

M. Streng's Sons Company, Limited, dealers in Scrap and Old Material, have moved to their new building at Walnut and River avenue, Allegheny, Pa.

Birmingham.

BIRMINGHAM, ALA., December 28, 1903.

As was to be expected, the demand for Iron the past week showed some diminution in the pace that has characterized it of late. The slowing up was only what was anticipated and desired. All along during the week the orders kept coming right up to Christmas Day. A sale was made late on December 24 to an Eastern buyer at \$9.75 (basis of No. 2 Foundry), delivery soon as could ship, after he had spent the day endeavoring to buy at \$9.50, shipment to be strung out during the first quarter. The fact that the buyer was an old and valued customer was the moving cause that secured the 2500 tons he wanted. There was another sale at \$10 basis of No. 2 Foundry, the amount being 2000 tons. There were other sales of similar lots in magnitude sold at prices varying from \$9.50 to \$9.75 and up to \$10. The sales at \$9.50 were not common, and they were made with reluctance, and secured only by those who came under the head of tried and valuable customers. The orders accepted at \$9.50 were as a rule taken with the condition exacted that shipment was to be made as soon as cars could be obtained and loaded. As far as can be ascertained there were no strung out deliveries at these prices. There were some orders, that might be characterized as a fair sprinkling of the business done, accepted on basis of \$9.75 for No. 2 Foundry, on which delivery varied as to time during the first quarter. But, as a rule, delivery was confined to dates within 60 days. Comparatively little business was taken beyond this limit, and there was only a limited amount registered for delivery as far ahead as March. For delivery beyond March no one will admit sales. One feature of the trading was the receipt of mail orders from regular customers specifying their wants and leaving to the seller the fixing of price. One interest received in one day orders of this character amounting to over 6000 tons, and others were similarly favored. Your correspondent endeavored to arrive at an approximate estimate of the business done at the varying prices, but the difficulty in the way is that while there

is no objection to publishing the outside price obtained, the inside price is often guarded with great jealousy and locked up securely. To aim at approximate accuracy under such circumstances is "Love's Labor Lost." There is no way that is practical to get at it. But the fact is pretty certain that, without any combination or concert of action, there is a feeling universal among the furnace interests that no further sales should be made under the basis of \$10 for No. 2 Foundry, and some have acted on that feeling and announced that as their price. The president of the leading interest said to your correspondent: "We have advanced our price to \$9.75 and \$10, and have made sales at both prices, and expect the outside price to be the ruling one in a few days." Similar statements were derived from other interests. To give force to this feeling a meeting of the furnace interests of this State has been called to assemble here to-day at 2 o'clock to discuss the Iron situation and to agree on some plan of harmonious action on the part of all who are interested. There will be an attempt made to revive the defunct association, and there is a strong influence in favor of doing that. But there would be no advantage in doing this unless it was a unanimous thing. So far the move has not reached that point. It is possible, but not probable, that the advocates may succeed in persuading the interests opposed to it to try it on just one more time. If they do, it will be on the condition of added and severe restrictions not attached to the government of the preceding associations. If the plan succeeds Iron will at once advance to the general price of \$10 for No. 2 Foundry.

The announcement made in these letters of late concerning the orders booked since November 1 has occasioned a good deal of comment, and more than one statistician has gone over results and more than verified what was stated as the amount. After a further careful investigation, the statement shows up too small. The order books of the two leading interests now show that the orders booked since November 1 amount to nearly 400,000 tons, the amount credited as the aggregate of all. It is generally conceded that the orders of all the other interests will amount to at least 200,000 tons more. The sum total is an amount that will test the credulity of many of your readers. The statement is not given on mere rumor, but is the result of a close canvas with but one object in view, and that was to get as near the solid facts as possible. Your correspondent believes the statement to be approximately correct. The total amount is pretty near the output for six months of the combined furnaces of the State of Alabama, and convincingly shows the character of the demand that has prevailed for iron.

The shipments of Iron are without cessation and are fully up to facilities furnished. The shipments of the Sloss Company for this month will amount to 50,000 tons, and this may be taken as an exemplar for all the interests. The export trade has been lost sight of in the magnitude of the domestic trade. We have run away from it, and its advances now meet with no encouragement.

The property on which the Mary Pratt Furnace is located has been sold to the A. & G. S. R. R. for \$80,000, and the transaction relegates that stack to the realms of a memory only. It was owned by the Alabama Consolidated Coal & Iron Company. The property will be used as railroad yards.

Although the officials of the Rod, Nail and Wire mill are very close mouthed concerning their intentions, it is very evident that they are making preparations to resume operations at the mill here as soon after January 1 as possible.

As has been stated in a previous letter, the Steel mill is also preparing to start again after January 1. During the enforced idleness of the mill many improvements have been installed that have been mentioned in previous letters as under contemplation, and it is now claimed that it can do what any other first-class mill can accomplish, and much that some cannot do. They will start with one order for 30,000 tons of Heavy Steel Rails, with more in sight at their command.

Business at the Pipe works yet wears a roseate hue, and while prices have not yet been actually marked up, they are reported as having a hardening tendency.

Concerning Coal and Coke there is no change from conditions mentioned in last letter. Operators here certainly have the call now for supplying the best consuming portions of the South, and cannot keep up with their orders. Some of them are yet growling about a shortage in car supply. That is an old story repeated every year. Yet we are on the eve of opening more mines, and adding to capacity that the various railroads cannot handle with promptitude and satisfaction.

(By Telegraph.)

BIRMINGHAM, ALA., December 30, 1903.

Some sales of Pig Iron have been made this week for prompt shipment on the basis of \$9.75 for No. 2 Foundry. It is generally held at \$10 for delivery beyond January, with some sales at that price. Furnace interests have held two meetings this week, but will not admit doing anything but

discussing the Pig Iron situation. It is generally understood that Pig Iron will be advanced by moderate steps to \$12 for No. 2 Foundry, but concert of action will be avoided. Influential interests still refuse to enter into any definite agreement concerning uniform action.

St. Louis.

CHEMICAL BUILDING, December 30, 1903.—(By Telegraph.)

Pig Iron.—In the execution of a moderate volume of sales the past week the tone of the market has held steady, with prices holding close to the \$9.50 mark, Birmingham, for No. 2 Foundry grade. The most important furnaces, it is said, are not encouraging the quotation of Foundry Irons at the present prices much beyond the first quarter delivery. While it is not expected that there will be any great pronounced urgency for Pig Iron immediately after January 1, the indications point to a growing trade. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry.....	\$13.25 to \$13.75
Southern, No. 2 Foundry.....	12.75 to 13.25
Southern, No. 3 Foundry.....	12.25 to 12.75
Southern, No. 4 Foundry.....	11.75 to 12.25
No. 1 Soft.....	13.25 to 13.75
No. 2 Soft.....	12.75 to 13.25
Gray Forge.....	11.25 to 11.75
Southern Car Wheel.....	21.00 to 21.25

Bars.—The wind up of the year has been marked by the usual curtailment of trade in this department among the jobbers. In lots from store Iron Bars at 1.80c. and Steel Bars at 1.90c.

Angles and Channels.—Rather quiet conditions prevail in these lines among the jobbers, and prices are covered by the quotation of 2.10c. in lots from store.

Rails and Track Supplies.—The degree of activity since last report has been of a moderate order, and price changes have been slight. We quote as follows: Angle Bars, 1.60c. to 1.65c.; Bolts, with Square Nuts, 2.60c. to 2.70c.; with Hexagon Nuts, 2.70c. to 2.80c.; Spikes, 1.90c. to 2c.

Pig Lead.—The extent of the buying has been moderate since our last, but prices have held very firm. The current quotation for Missouri brands is nominally 4.17½c.

Spelter.—Trade has not been generous in the Spelter market, but prices have held steady between 4.65c. and 4.70c.

Sound Labor Doctrine by an Ohio Mayor.

Several weeks since members of the local typographical union petitioned the City Council of Fremont, Ohio, to cause to be placed on all city printing the union label. The council passed the resolution granting the petition of the union and sent the resolution to Mayor Engler for his approval or rejection. The Mayor, after considering the matter, decided to veto the resolution, and in his communication to the council said in part:

It is impossible for me to understand upon what theory a legislative body like yourself, designed for the benefit of all the people of our city, can justify its action in denying, as this resolution does, to a part of our people the equal protection and benefit of the law. Any legislation designed to limit its benefits to one class and denying the benefits to any other class, is class legislation.

I have been taught to believe that class legislation is always vicious in its tendency, contrary to the spirit of our free institutions, and if allowed to go unchallenged must ultimately work to the injury of the body of the people and perhaps to the injury of the class it is intended to thus unfairly benefit.

Is the public money collected exclusively from the class that controls the union label? If not, why should that class be the only persons benefited by its expenditure? If you have the lawful right to limit to this particular class the benefits to be derived from such public money as may be spent for printing, you must also have the lawful right to limit to some other particular class the benefits to be derived from other expenditures of the public money. In this manner we would soon have the unhappy spectacle of a large majority of our people compelled to contribute by their taxes to the support of such classes and themselves denied the privilege of participating in the benefits to be derived from such expenditure of the public funds.

The illegality of such proceedings must be manifest to every citizen who will give to it a moment's reflection. If the passage of this resolution is urged in the sacred cause of labor let us not forget that substantially all our people, male and female, are laborers in some field of human endeavor and all necessary to the prosperity and well-being of our city.

The name of the Pittsburgh Shear Knife & Machine Company, at Pittsburgh, is to be changed to the Heppenstall Forge & Knife Company. The concern are manufacturers of forgings, solid steel shear knives, steam hammers, punches and shears and special machinery.

The New York Machinery Market.

NEW YORK, December 30, 1903.

Being the closing week of the year, the week under review held very little of interest in the way of new machinery business. There were a few inquiries for second-hand equipment and a little straggling business in small new machines. As for orders worth talking about, however, there was a total absence. Every one seems to be glad that the dawning of the new year is so close at hand, and it seems that they will feel still better after 1904 has dawned awhile and settled the uncertainty which exists as to its immediate prospects. Even the cheerful tones of some of the optimists who have been harping on the anticipation of better things "after the first of the year," have mingled with them a note of distrust lest the new year wait until after the Presidential election before it wipes out the spirit of hesitancy. The number of merchants who honestly believe that conditions are approaching a much better state is, nevertheless, still large. They are patiently following up the numerous propositions which are being held back, and when they are successful in closing them, they will not only deserve the credit due them for helping in bettering affairs, but will have the advantage of booking the orders that their persistent enterprise has netted them.

Despite the fact that the "Pennsylvania Tunnel Job," as the Pennsylvania Railroad's much mooted New York project is termed in the Street, seems to be a rather cut and dried affair so far as the letting of contracts is concerned, those interested in any way in this line of work are still following it eagerly. There is a general feeling that the matter will be definitely settled and the result announced shortly after the beginning of the new year. The matter has focused down to a belief something like this: John B. McDonald, who is building the Rapid Transit Tunnel, stands an excellent chance of capturing the entire contract. If he does, he will probably sublet the river portions of it to Pennsylvania Railroad contractors, performing only the land sections himself. The materials required throughout, or at least a large portion of them, will be furnished by the Pennsylvania Railroad and produced at their own plants. These theories, of course, are mere conjecture, but those giving them vent have spent a great deal of time, labor and some money on the matter, and have gotten as close to the bottom as possible.

Another development of interest in connection with the General Electric Company's affairs has just come to the surface. They have received an additional order in connection with the New York Central electrification project. It calls for some 500 cars and their mechanical equipment. Of these it is stated 340 will be motor cars and 160 "trailers" having no motive power of their own. The work is to be performed at the Lynn works. It is thought that this order will tend to fill up these shops and hasten the day when the company will be forced to buy the additional equipment which they specified some time ago.

There is a report in the trade to the effect that the Singer Mfg. Company of Elizabethport, N. J., contemplate the erection of a plant in Canada near Montreal.

From 52 William street, New York, the headquarters of the Holthoff Machinery Company, or what is now the Power & Mining Machinery Company, orders for a good sized amount of equipment can be looked for shortly by machinery houses. Though the company have lately made extensive improvements and additions to their plant at Cudahy, Wis., they have decided upon a further enlargement; in fact, they have already let the contract for a new building, the erection of which will be started as soon as possible. This new addition is to be used as a machine shop and will be 160 x 300 feet. Like the other buildings, it will be equipped throughout with modern machinery, which has not yet been secured. The company are now considering the mechanical equipment and preparing the specifications. It will be recalled that this concern purchased a substantial consignment of machine tools for their plant last November. The orders were placed in the West. The Liberty street houses are, however, hoping for better luck this time, and some of them, no doubt, will open the year with the new company's name on their books. The company have recently increased their capital stock to \$2,500,000, and under date of December 24 have issued a statement, which is, in part, as follows:

"The Loomis-Pettibone Gas Machinery Company, New York, after the recent increase in capital, have now been merged with the Holthoff Machinery Company of Milwaukee, Wis., under the new corporate name of Power & Mining Machinery Company. We are making extensive improvements to our Milwaukee plant to meet the increasing demand for the American Crossley gas engines, Loomis-Pettibone gas apparatus and Holthoff mining machinery. We shall continue, under Mr. Holthoff's personal supervision, the manufacture of mining, smelting and milling plants and machinery." The officers are Benjamin Guggenheim, president; Cyrus Robinson, vice-president; H. C. Holthoff, vice-president; Burdett Loomis, Jr., vice-president; B. T. Leuzard, secretary; Leon P. Feustman, treasurer; Hawley Pettibone, consulting engineer.

It is probable that in the early part of the new year the Grand Trunk Railway system will be in the market for tools

for their new machine shop at Island Park, Vt., where they have been making extensive additions, which include a new machine shop, 50 x 125 feet. We can officially state that the equipment for this shop has not yet been purchased.

Edw. Rennenburg & Son, Baltimore, Md., have not yet fully decided just what they will require for the equipment of their new building. They are to increase their capacity by the erection of an additional machine shop, 40 x 125 feet, and a new engine house, 30 x 50 feet, the total cost of which will be about \$11,000. The buildings will be of brick and steel, with pitched roofs covered with corrugated iron. The machine shop will be equipped with an electric traveling crane and a full complement of up to date machinery, while in the engine house will be installed two White & Middleton gas engines of 60 and 40 horse-power, respectively; Ingersoll air compressor, electric generator and hydraulic pump. The engine house equipment has been purchased. The firm do general machine work and make boilers and oyster and fruit packers' machinery.

Westinghouse, Church, Kerr & Co., New York, have received an order from the Manila Construction Company, an American corporation conducting operations in the city of Manila, P. I., for a complete power equipment for the city traction system. The order comprises the following machinery: Three 750-kw. Westinghouse turbo generator units, two compound engine exciter units, one motor driven exciter unit, three 50-kw. rotary converters, one 300-kw. rotary converters, four 250-kw. oil insulated transformers, complete switchboard, one series booster. This booster is mounted on the extended shaft of one of the rotary converters. The first turbo-generator unit will be delivered in about nine months. The turbine will operate at 150 pounds steam, 26 to 27 inch vacuum and 150 degrees superheat. It is fitted with the usual by-pass for securing an overload capacity of 50 per cent. It is also equipped with a quick-closing throttle valve. The turbine machinery will also furnish current to the local light and power system.

The 40,000 horse-power development on the Susquehanna River, which has been under contemplation for a year or two, is now practically assured by the investment of New York capitalists in the project of probably \$10,000,000. It is proposed to develop the power at Conowingo, Md., and distribute it to Baltimore, Havre de Grace, Elkton and other Maryland towns, as well as towns in Southern Pennsylvania and Delaware. Interested in the scheme is Anthony N. Brady of New York, who, with associates, have taken \$1,000,000 stock in the United Electric Light & Power Company, controlling the lighting of Baltimore. There will be a number of changes in the directorate of the United Electric Company, and the presidency has been tendered to S. Davies Warfield, president of the Continental Trust Company, Baltimore, Md., who conducted the negotiations with Mr. Brady. It is expected that the Susquehanna works can be completed in 1905.

A large Portland Cement plant is to be built near Bath, Pa., and the trade have had an inkling that there would be something doing soon in the way of machinery purchases. The plant is to be located on a 320-acre site, and will have a daily capacity of 2500 barrels. It will be modern throughout and will be constructed of steel and concrete. The plans, which are practically complete, call for a large power plant and included in the equipment of the mill will be roasters 100 feet long. At the head of the company is George W. Roydhouse, president of the Northwestern National Bank of Philadelphia. The other officers are George W. Miller of Pittsburgh, vice-president; J. A. Horner of Bath, secretary and treasurer, and Fred B. Banks, superintendent.

The American Lumber Company, Albuquerque, New Mexico, Ira B. Bennett, general manager, have placed with the S. A. Woods Machine Company of Boston, Mass., through R. B. Dunsmore, Western representative, their entire order for machinery for their new planing mill and box factory. It is said that this will be one of the largest complete and modern plants in the country and will represent the latest and best in the way of machinery equipment.

Woolston & Brew, who have been prominently identified with the engine trade of this country, representing several high grade makes in New York, Boston and Philadelphia for several years, have just embarked into the automobile business. They have located large sales, repair and storage departments in a large building at 152 West Fifty-sixth street, New York. After a careful personal investigation of the facilities and shop methods of all of the prominent manufacturers throughout the country, as well as a careful study of the 1904 models, they have contracted to handle in the metropolitan district the 24 horse-power triple vertical cylinder touring car manufactured by the E. R. Thomas Motor Company of Buffalo, N. Y., and the Stevens-Duryea runabout, manufactured by the J. Stevens Arms & Tool Company of Chicopee Falls, Mass.

The following bids were opened December 15 for supplies for the various navy yards:

League Island, Washington and Annapolis.

Bidder 4. Drew Machinery Agency, Manchester, N. H.
13. Bement, Niles & Co., Philadelphia, Pa.

30. Manning, Maxwell & Moore, New York.
 51. Fairbanks Company, New York.
 55. Niles-Bement-Pond Company, New York.
 Class 24. Two engine lathes—Bidder 51, \$1240; 30, \$1420.
 Class 25. Bending rolls—Bidder 30, \$1830; 55, \$2125, \$2410 and \$2980; 4, \$2180; 13, \$2595.

Norfolk and Charleston.

- Bidder 7. General Electric Company, Schenectady, N. Y.
 10. Thresher Electric Company, New York.
 11. Holzer-Cabot Electric Company, Brookline, Mass.
 12. Crocker-Wheeler Company, Ampere, N. J.
 28. D'Olier Engineering Company, Philadelphia, Pa.
 36. Hill, Clarke & Co., Boston, Mass.
 37. Racine Engine & Iron Works, Racine, Wis.
 80. Manning, Maxwell & Moore, New York.
 93. Atlantic Works, Philadelphia, Pa.
 94. B. F. Sturtevant Company, Boston, Mass.
 96. S. A. Woods Machine Company, Boston, Mass.
 97. Buffalo Forge Company, Buffalo, N. Y.
 99. S. M. Price Machinery Company, Norfolk, Va.
 103. Bullock Electric Company, Cincinnati, Ohio.
 107. Smith-Courtney Company, Richmond, Va.
 111. Hartford Blower Company, Hartford, Conn.
 115. Prentiss Tool & Supply Company, New York.
 116. Thompson Electric Company, Chicago, Ill.
 117. Eck Dynamo & Engine Works, Belleville, N. J.
 Class 1. One hundred and fourteen electric fans and a miscellaneous quantity of electrical supplies—Bidder 28, \$4900.90; 11, \$4952.50 and \$5224.40; 7, \$4983.59; 117, \$5295; 94, \$5407.45.
 Class 2. Ammunition hoists and fittings—Bidder 116, \$2315.60; 94, \$2829; 111, \$3397.00; 7, \$4289.92; 28, \$4511.39; 11, \$4422.80; 12, \$4557.10; 10, \$4790.50.
 Class 3. Four generating sets—Bidder 37, \$10,400; 94, \$11,600; 12, \$11,637; 97, \$11,941.60; 103, \$11,992; 7, \$12,300.
 Class 19. Two electric deck winches—Bidder 7, \$2918.27; 11, \$2935.30 and \$3135.20; 10, \$3658.
 Class 20. One patternmaker's lathe—Bidder 115, \$598; 36, \$599; 99, \$775; 80, \$825.
 Class 21. One reciprocating power mortiser—Bidder 115, \$195; 107, \$196; 93, \$200; 80, \$396; 96, \$675, \$725 and \$860.

Portsmouth, Boston and Newport.

- Bidder 5. Drew Machinery Agency, Manchester, N. H.
 6. Hobbs Mfg. Company, Worcester, Mass.
 7. Thomas & Lowe Machinery Company, Providence, R. I.
 16. S. A. Woods Machine Company, Boston, Mass.
 20. Bullock Electric Mfg. Company, Cincinnati, Ohio.
 22. Hill, Clarke & Co., Boston, Mass.
 24. M. T. Davidson, Brooklyn, N. Y.
 29. Halzer-Cabot Electric Company, Brookline, Mass.
 33. Crocker-Wheeler Company, Ampere, N. J.
 35. Keystone Electric Company, Erie, Pa.
 36. Bentel-Margedant Company, Hamilton, Ohio.
 51. Dietrich & Harvey Machine Company, Baltimore, Md.
 61. Doubleday-Hill Electric Company, Pittsburgh, Pa.
 67. Manhattan Supply Company, New York.
 70. Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.
 78. National Electric Company, Milwaukee, Wis.
 80. Geo. F. Black Mfg. Company, New York.
 82. Niles-Bement-Pond Company, New York.
 83. Manning, Maxwell & Moore, New York.
 89. J. B. Roach, Brooklyn, N. Y.
 92. Eck Dynamo & Motor Works, Belleville, N. J.
 94. American Tool Works Company, Cincinnati, Ohio.
 95. Garvin Machine Company, New York.
 97. General Electric Company, Schenectady, N. Y.
 98. W. H. Foster, New York.
 100. Prentiss Tool & Supply Company, New York.
 Class 1. One 10 horse-power electric motor—Bidder 97, \$318; 70, \$335; 78, \$375; 89, \$385; 92, \$399; 33, \$418.50; 5, \$420; 20, \$433.10; 35, \$435; 29, \$439; 61, \$484.50.
 Class 2. Four electric motors—Bidder 33, \$353; 94, \$334.28; 29, \$464; 89, \$485; 5, \$504; 61, \$513.40; 92, \$515; 20, \$518; 35, \$522; 70, \$548.
 Class 3. One motor—Bidder 89, \$890; 29, \$986; 78, \$1138; 35, \$1140; 5, \$1143; 97, \$1303; 70, \$1345; 20, \$1762.42.
 Class 10. One grinder—Bidder 83, \$58.25; 67, \$280.
 Class 11. One automatic knife grinder—Bidder 67, \$70; 82, \$199; 7, \$268; 16, \$280.
 Class 12. One pattern maker's turning lathe—Bidder 6, \$130; 36, \$150; 82, \$160; 5, \$199.
 Class 13. One standard engine lathe—Bidder 22, \$1499; 7, \$1535; 95, \$1565; 82, \$1685; 94, \$1782; 82, \$1855; 100, \$1945.
 Class 14. One engine lathe—Bidder 7, \$425; 95, \$435; 22, \$444; 82, \$510; 94, \$510.
 Class 15. One metal planer—Bidder 100, \$974; 22,

\$1169; 94, \$1190; 7, \$1240; 82, \$1270, \$1385, \$1150 and \$1115.

- Class 16. One buzz planer—Bidder 6, \$150; 7, \$155; 100, \$174; 82, \$215; 36, \$220.
 Class 17. One cabinet surface planer—Bidder 6, \$215; 36, \$480; 16, \$523; 82, \$551; 100, \$599; 7, \$654.
 Class 18. One pedestal tenoning machine—Bidder 7, \$179.60; 5, \$185; 36, \$200; 82, \$200; 100, \$235.
 Class 19. One 24-inch draw cut shaper—Bidder 98, \$900.
 Class 20. One shaper—Bidder 94, \$443; 82, \$449.
 Class 21. One drilling, milling and boring machine—Bidder 7, \$2060; 51, \$2228; 82, \$2245; 98, \$2245; 5, \$3646.
 Class 22. One No. 3 sinking machine—Bidder 82, \$890; 5, \$1234.
 Class 23. Twenty vertical single boiler feed pumps—Bidder 5, \$920 and \$1540; 80, \$1157; 24, \$1160; 88, \$1380.

Mare Island and Puget Sound.

- Bidder 2. Eck Dynamo & Motor Works, Belleville, N. J.
 3. Drew Machinery Agency, Manchester, N. H.
 6. Wittler-Corbin Machinery Company, Seattle, Wash.
 9. Crane Company, Seattle, Wash.
 14. Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.
 28. Hamilton Machine Tool Company, Hamilton, Ohio.
 38. Holtzer-Cabot Electric Company, Brookline, Mass.
 52. General Electric Company, Schenectady, N. Y.
 58. Manning, Maxwell & Moore, New York.
 62. Becker-Brainard Milling Machine Company, Hyde Park, Mass.
 63. Handlan-Buck Mfg. Company, St. Louis, Mo.
 76. Henshaw, Buckley & Co., San Francisco, Cal.
 81. Fox Bros. & Co., New York.
 84. Halliday-Henshaw-Buckley Company, Portland, Ore.
 88. Garvin Machine Company, New York.
 92. Pacific Tool & Supply Company, San Francisco, Cal.
 94. Pacific Hardware & Steel Company, San Francisco, Cal.
 96. Manhattan Supply Company, New York.
 100. Herron, Rickard & McCone, San Francisco, Cal.
 107. B. F. Sturtevant Company, Boston, Mass.
 111. Doubleday-Hill Electric Company, Pittsburgh, Pa.
 113. Prentiss Tool & Supply Company, New York.
 116. Buffalo Forge Company, Buffalo, N. Y.
 Class 2. Two No. 6 fan blowers, one spare armature and parts for motors—Bidder 111, \$698; 38, \$807; 116, \$841.70; 2, \$860; 107, \$1001.75; 52, \$1090.81.
 Class 3. Three transformers—Bidder 111, \$385; 55, \$412; 14, \$459; 52, \$494.
 Class 4. Two electric motors—Bidder 52, \$305; 14, \$327.90.
 Class 27. One gap lathe—Bidder 76, \$320; 58, \$345 and \$365; 100, \$395; 113, \$470.
 Class 28. One double triple quick stroke shaper—Bidder 58, \$405; 76, \$420, \$470 and \$530; 92, \$468; 81, \$533.50.
 Class 29. One upright drill press—Bidder 100, \$92; 76, \$122 and \$125; 58, \$130; 92, \$148; 28, \$149.
 Class 30. One upright drill press, motor driven—Bidder 88, \$115; 58, \$245; 6, \$308; 84, \$324; 100, \$330.
 Class 31. One screw cutting engine lathe—Bidder 28, \$915; 58, \$1000; 92, \$1040; 84, \$1133.
 Class 32. One universal milling machine—Bidder 63, \$925; 62, \$930; 58, \$975; 6, \$1045; 84, \$1055; 92, \$1062; 3, \$1471.50.
 Class 33. One pipe threading and cutting off machine—Bidder 88, \$475; 84, \$529; 94, \$556; 81, \$569; 92, \$575; 9, \$584; 58, \$640; 3, \$665; 96, \$747.
 The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until January 12 for machine tools and a quantity of miscellaneous supplies for the Portsmouth and Boston navy yards.

The South Sharon Board of Trade, South Sharon, Pa., have appointed a committee consisting of John Fitzpatrick and John A. Borland, the latter secretary of the board, to confer with the Sharon Board of Trade in regard to sending a committee after the first of the year to see W. E. Corey, president of the United States Steel Corporation, to secure information as to when the mills at Sharon and South Sharon may be started. The mills at these places have been idle for several months.

The appraisalment of the real and personal property of the Susquehanna Iron & Steel Company, Columbia, Pa., has been filed by the receivers. It places the value of the several plants at \$1,029,373.91, the book accounts at \$50,000, bonds \$15,500, and iron on hand \$54,239, making a grand total of \$1,149,112.91. The schedule of liabilities was not filed.

Cincinnati Machinery Market.

CINCINNATI, OHIO, December 26, 1903.

General conditions in Cincinnati machinery circles remain practically unchanged. With the holiday season upon them, and inventory taking monopolizing the greater part of their time, manufacturers are patiently waiting for the new year's developments. Inquiries received are very encouraging, and indications are good that buyers are on the alert and are only waiting for the period of dullness incident to this season to pass before making extensive purchases. The pig iron market is again on the upward trend, and as it is quite presumable that the drop in this commodity some months since saw many manufacturers with a supply of this product on hand, it is but natural that they will exercise the utmost care before making further purchases. Machinery prices are being maintained, and notwithstanding the desire to make a creditable showing for the closing months of the year, there has evidently been no deviation from this rule. The pulse of the market seems stronger than usual at this season of the year, and manufacturers generally are very well pleased with conditions, which are assuming a brighter and more satisfactory outlook. It is anticipated that by the middle of January at farthest trade will once more be on the up grade, and while it is not expected the conditions of last year will prevail at this time, it is hoped that a strong, normal state of affairs will obtain. Several of the larger shops have added to their equipment in anticipation of this condition, and should trade develop as expected, they will be in far better shape to take care of business than at any previous time. The money market, an important factor in shaping trade conditions, is now easier, and this it is expected will have a tendency to cause the railroads, which for several months have held in abeyance plans for extensive expansion, to come forward and secure what tools they need. Foreign inquiries are developing in good shape, and orders are coming in from Russia, Germany and England, and also from our new possessions of the seas. The south is having a good demand for sugar mill machinery and the development of new mining districts is furnishing quite a field for the engine and pump manufacturers.

The American Tool Works Company report that the last month has been a very satisfactory one and far exceeded their expectations. Orders continue coming in, and conditions of trade are such that this year they will keep their shops open and not shut down for ten days or two weeks, as has been their custom during the holiday season. They are to-day shipping to a Western point one of their 36-inch lathes, all geared head, motor driven through silent chain, a radical departure in lathe construction. They also have several different sizes of lathes with similar mechanism in process of construction, which they are confident will prove very efficient tools.

The R. K. Le Blond Machine Tool Company are installing a new General Electric 240-kw. generator, direct connected to a 350 horse-power Greenwald engine. This will dispense with their other engine and generators, and each machine in the shop will receive its power direct from the new generator. They report trade somewhat on the increase, and feel satisfied that the next 30 days will see a marked change for the better. They have an order for five of their large extension bed gap special lathes for Government service from Japan; ten special lathes, special boring machines, &c., from Switzerland; two of their No. 3 Universal Millers from Rotterdam, and several small sized lathes from England.

The Cincinnati Machine Tool Company note quite a letting down in trade, and while inquiries are numerous, there is a hesitancy about closing contracts as rapidly as they desire, consequently business is more or less spasmodic. As noted in *The Iron Age* several weeks ago, their new shops were being delayed on account of inability to receive material. This condition is now changed, and the work has proceeded until the first story of iron is now completed and all is ready for brick work. They expect to have the building under roof within next week or two, and rush forward to its completion.

The Cincinnati Milling Machine Company report they entered as many orders during the month of November this year as they did during the same month last year. While domestic orders have decreased, the increase in foreign trade has made up the shrinkage. They confidently expect that December will equal same month last year in volume of business booked. They have shipped their millers to a number of foreign countries, among which were three for Brazil points.

The I. & E. Greenwald Company say that orders are not

coming in as rapidly as before, but that they are very busy working on those already received. They feel greatly encouraged and are doing considerable estimating both at home and abroad.

Schumacher & Boye, in line with others, are feeling the dullness of trade. While business has increased considerably during the month, comparisons with a year ago are far from satisfactory. Their new office and wareroom building, situated on Spring Grove avenue, presents a fine appearance. It is of pressed brick construction and is 80 x 150 feet. The office, which occupies the second floor, is well lighted and ventilated, and is furnished with all the modern conveniences. The finish is natural wood with hard wood floors. There are two reception rooms, with bay window overlooking the street. These rooms are handsomely furnished in oak, and the appointments are perfect in all detail.

The John H. McGowan Pump Company still continue busy and are well satisfied with trade, especially from Southern points. They are at present doing considerable estimating for this section, and are working on several large contracts for eastern points.

New York.

NEW YORK, December 30, 1903.

Pig Iron.—There is quite a good inquiry, but sales have been on a rather moderate scale. We quote: Northern No. 1 Foundry, \$15 to \$16; No. 2 X Foundry, \$14.50 to \$15; No. 2 Plain, \$14 to \$14.50, and Gray Forge, \$13.50 to \$13.75, tidewater. Tennessee and Alabama brands are quoted: \$14 to \$14.50 for No. 1, \$13.50 to \$13.75 for No. 2 and \$13 to \$13.50 for No. 3.

Steel Rails.—The most important event of the week has been the sale, by a Western mill, of 30,000 tons for a Canadian railroad, delivery at Port Arthur. The freight rates on foreign Rails, which competed on this order, are such that the sale must have netted the American mill a comparatively high figure, for export business. Standard Sections are quoted \$28, while Light Sections are quoted from \$23 to \$28, according to weight. There is a fair inquiry for Light Sections in small individual lots.

Cast Iron Pipe.—More inquiries are being received from municipalities and water and gas companies. The volume of business indicated by these inquiries is now running far in excess of any previous December. The water and gas companies all over the country are coming into the market fully a month earlier than usual. It would appear that the shrewdest buyers are now preparing to place contracts. Among the recent orders placed is one for over 8000 tons of principally 20 and 24 inch, by the Consolidated Gas Company of this city, with the leading Pipe interest, for delivery next year. Some of the local municipal business has been secured by an Eastern independent company. Prices are firmer, but carload lots continue to be quoted at \$28 per gross ton for 6 to 10 inch, and \$27 for 12-inch upward, at tidewater, with, of course, less rates on large quantities.

Finished Iron and Steel.—The reaffirmation of prices has influenced railroad companies to advise the leading bridge interest that they expect shortly after the opening of the new year to place a considerable quantity of business. Some inquiries have already been received, on which tenders are being made. The business booked by this interest during 1903 will very closely approximate the business of last year, and the new year will be started with fully six to seven months' work in hand. Some of this will, of course, not be needed at once and more business can thus easily be handled. A considerable tonnage on Rapid Transit work for this city is yet to be specified. Nothing of immediate importance has developed in the building line, but the prospects are excellent for activity in the local building trade as the season advances. The Plate trade looks much more promising. Specifications are in the market for considerable work, one proposition calling for 2000 tons, while others range from 600 to 1500 tons. The specifications are out for the boilers of the North River power plant for the Pennsylvania Railroad tunnel, which will take 600 tons. Plate prices at this point are now figured on the actual freight rate above the Pittsburgh basis, which makes a reduction of 70c. per ton. Bar Iron manufacturers report a decided increase in inquiry, with numerous buyers desiring to place orders at figures quoted them two or three weeks since. The views of manufacturers have stiffened, however, and it is stated that these low prices are not now obtainable. We quote, at tidewater, as follows: Beams, Channels, Angles and Zees, 1.74½c. to 2c.; Tees, 1.79½c. to 2c.; Bulb Angles and Deck Beams, 1.84½c. to 2.05c. Sheared Plates in carload lots are 1.74½c. to 1.85c. for Tank, 1.84½c. to 2c. for Flange, 1.94½c. to 2.10c. for Marine, and 1.94½c. to 2.50c. for Fire Box, according to specification. Common Bar Iron, 1.30c. to 1.40c.; Refined Bars, 1.45c. to 1.60c., according to quality; Soft Steel Bars, 1.44½c. to 1.50c.

Old Material.—A better demand is observed in this branch of trade, which is perhaps greater in Steel Scrap than in other classes of Old Material. Pittsburgh is said to be

sending inquiries to this market for Old Steel Rails and Steel Scrap. Buyers, however, are looking for very low prices. Steel works in Eastern Pennsylvania have secured some Rails at a price under anything previously quoted. A sale of 1200 tons, consisting of half T's and half Girders, is reported at about \$9, f.o.b. Sound point. This lot will probably be exported. It is also rumored that an Eastern railroad has sold over 6000 tons of Old Steel Rails, which may also be exported. The market is in such condition that the sellers of any considerable quantity must be ready to name low figures. Iron Scrap is fairly firm. Quotations per gross ton, New York or vicinity, are as follows:

Old Iron Rails.....	\$15.50 to \$16.00
Old Steel Rails, long lengths.....	12.00 to 13.00
Old Steel Rails, short pieces.....	11.00 to 11.50
Relaying Rails, heavy sections.....	18.00 to 19.00
Old Car Wheels.....	12.50 to 13.00
Old Iron Car Axles.....	16.00 to 17.00
Old Steel Car Axles.....	14.00 to 15.00
Heavy Melting Steel Scrap.....	11.00 to 11.50
No. 1 Railroad Wrought Iron.....	12.50 to 13.50
Iron Track Scrap.....	11.50 to 12.50
Wrought Pipe.....	9.00 to 10.00
Ordinary Light Iron.....	7.00 to 7.50
Cast Borings.....	5.00 to 5.50
Wrought Turnings.....	8.00 to 8.50
No. 1 Machinery Cast.....	12.00 to 12.50
Stove Plate.....	9.50 to 10.50

Metal Market.

NEW YORK, December 30, 1903.

Pig Tin.—The speculation in London of the Chinese operators continued and flourished. As a result prices have advanced in all markets. The higher prices advanced, however, the more cautious became consumers in their purchases. Evidently no short element was caught and forced into the market to cover, for there was no scramble for the metal. Prices just went up peg by peg in Singapore and London, and here values followed nominally. At the close to-day this market advanced to 28.60c. to 28.80c. for spot and 28.25c. to 29c. for January deliveries. The London market closed £131 17s. 6d. for spot and £132 7s. 6d. for futures. The arrivals thus far this month have amounted to 1625 tons, and it is figured that there are 2265 tons afloat.

Copper.—Conditions are absolutely without change. The market possesses no feature and is devoid of any life whatever. Consumers are showing the same apathy which they have exhibited for a number of weeks. The "official" quotations remain unchanged and are: Lake, 12½c. to 12¾c.; Electrolytic, 12¼c. to 12½c.; Casting, 12¼c. to 12¾c. There are no offerings of outside lots to speak of. From London reports also show a very light amount of business. Quotations there are as follows to-day: Spot, £56 17s. 6d.; futures, £56 10s.; Best Selected, £60 10s.

Pig Lead.—The market is quiet and unchanged. Strict spot is quoted 4.37½c. here. The figures recently established by the American Smelting & Refining Company are unchanged at 4.25c. for Desilverized, based on 30 days' shipment in 50-ton lots. St. Louis is quoted 4.20c. to 4.25c., and London has advanced to £11 5s.

Spelter—Is unchanged. Spot is quoted 5c. and January delivery can be had for 4.85c. The London market advanced to £21 10s.

Antimony.—While quotations are unchanged here, the London market is weaker and lower. The market is easy at 7c. for Cookson's, 6.25c. for Hallett's, and 5.62½c. for other brands.

Nickel.—No change is noted in this market, 40c. to 45c. being quoted for large lots, and 50c. to 60c. for smaller quantities.

Quicksilver.—The market is quiet, but steady. Flasks of 76½ lbs. are quoted at \$47.50. London is quoted at £8 5s.

Tin Plates.—The market is quiet, with a fair amount of business in a small way. Large consumers are said to be holding out of the market. Quotations are made on the basis of \$3.60 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to \$3.79, New York.

A petition in insolvent bankruptcy has been filed in the United States District Court, at Pittsburgh, against the Woodworth-Evans Company, founders and machinists.

The Jones & Laughlin Steel Company, Pittsburgh, Pa., have completed the building of a fifth blast furnace at their Eliza plant, known as No. 5, and which is ready for blast. The furnace was built in record breaking time, being completed in just seven months from the time ground was broken. The stack is 85 x 21 feet, and will have a daily output of about 500 tons. New blowing engines are being installed at the company's Soho Furnace, which will considerably increase the capacity of this stack. The five Eliza furnaces and the Soho will give the company a daily output of about 2800 tons of pig iron.

Iron and Industrial Stocks.

The tendency during the past week has steadily been in the direction of higher prices. While some improvement has occurred in railroad stocks, the most important development of the week has been among the industrials. Under the leadership of the electrical construction companies, the general industrial line has moved forward, gaining strength almost every day. A noteworthy exception, however, was a sale of 100 shares of Colorado Fuel preferred. The last sale of this stock occurred in August, when 100 shares sold at 90. The recent sale was made at 65, representing a decline of 25 points. This decline, however, was regarded as bringing the issue down to a level more in keeping with the price of the common stock. Some of the week's changes are as follows: American Can preferred advanced from 31½ to 34; Car & Foundry common 19¼ to 20½, preferred 68 to 69½; Locomotive common 18½ to 19½; Colorado Fuel 27 to 33; Crucible Steel preferred 28¾ to 31; Pressed Steel common 28¼ to 33½, preferred 67 to 70; Railway Spring common 18½ to 23½, preferred 75 to 79; Republic common 6½ to 7¼, preferred 40½ to 42; Sloss-Sheffield common 31 to 33; Tennessee Coal & Iron 36 to 39½; United States Steel common 10½ to 12½, preferred 55½ to 58½, new 5's 69½ to 71. The last sales of active stocks up to 1.30 p.m. on Wednesday were as follows: Car & Foundry common 20, preferred 68; Locomotive common 18½, preferred 76¼; Colorado Fuel 30½; Pressed Steel common 30¾, preferred 70; Railway Spring common 22¾, preferred 78½; Republic common 7¾, preferred 42; Sloss-Sheffield common 33, preferred 79; Tennessee 38½; United States Steel common 12, preferred 57, new 5's 70½.

It is announced that the Pittsburgh Coal Company of Pittsburgh have decided to finance their floating debt and short termed bonds by a bond issue. The company have an authorized capital stock of \$64,000,000 equally divided between preferred and common shares. The preferred stock is 7 per cent. cumulative. The floating debt was incurred under the vote of last September, authorizing the purchase of \$15,000,000 common and \$2,500,000 preferred stock of the Monongahela River Coal & Coke Company, payment to be made through issue of noninterest bearing notes maturing in three annual installments during the next three years.

The stockholders of the American Card Clothing Company have voted not to accept the proposition of the directors to reduce the capital stock from \$1,500,000 to \$500,000, the necessary two-thirds votes lacking 200 shares. However, it is expected that favorable action will be taken at an adjourned meeting.

Dividends.—The Philadelphia Company of Pittsburgh have declared the regular quarterly dividend of 1½ per cent. on the common stock, payable February 1. C. H. Earle, Jr., of Philadelphia, has been elected a member of the Board of Directors of this concern, to take the place made vacant by the recent death of William L. Elkins of Philadelphia.

The Union Switch & Signal Company of Pittsburgh have declared the regular quarterly dividend of 2½ per cent. on the preferred stock and 2 per cent. on the common stock, payable January 1.

The Manufacturers' Light & Heat Company of Pittsburgh, suppliers of natural gas, have declared the regular quarterly dividend of 1½ per cent., payable January 20.

The Westinghouse Electric & Mfg. Company of Pittsburgh have declared the usual quarterly dividend of 2½ per cent. on the preferred, assenting and nonassenting stock, payable January 11.

E. W. Bliss Company have declared a quarterly dividend of 2 per cent. on the preferred and 2½ per cent. on the common stock, both payable January 2.

American Shipbuilding Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable January 15.

In the courts at Pittsburgh an opinion has been handed down in the matter of the application for a new trial in the case of the Losier Gas Engine Company of Rochester, N. Y., against John E. Dubois, in which case the plaintiff was given a verdict for \$34,250 for a breach of contract in the making of gas engines. Judge Buffington says that as the case required three weeks to try he is loath to open it again; that the jury was an intelligent one, and that the verdict was not excessive. He decides that if the plaintiff will, within the next ten days, file a remittur for \$2500, the motion for a new trial will be refused.

After January 1 the general offices of the American Sheet & Tin Plate Company, the combined interest of the American Sheet Steel Company and American Tin Plate Company will be located on the thirteenth floor of the Frick Building, Pittsburgh, Pa., in rooms now occupied by the Crucible Steel Company of America.

Trade Publications.

Special Cars.—The car catalogue of the Continental Car & Equipment Company, New York City, is a standard size, 9 x 6 inch pamphlet of 24 pages, illustrating and giving general specifications relative to several different types of cars built by the company. Both narrow and standard gauge cars are shown, made for general railroad service, as well as for special use on sugar plantations, in industrial plants, for mine haulage, in logging service, &c.

Steam Superheater.—The American Superheater Company, 176 Federal street, Boston, Mass., have issued a 9 x 6½ inch pamphlet catalogue of 24 pages, showing the appearance and construction of the American superheater as made by this company. Several pages are devoted to reproduction of an article on "The Practical Economy of Using Superheated Steam," by P. Nolet, which was translated by George L. Fowler and published in *Steam Engineering* some months since.

Sand-Lime Brick.—A 7¼ x 5¼ inch, 16-page pamphlet, descriptive of the process of manufacture of sand-lime brick, as practiced by the American Sand-Lime Brick Company, 225 Dearborn street, Chicago, Ill.

Rotary Engine Driven Generating Sets.—A 7 x 9¼ inch pamphlet of 16 pages, constituting Bulletin No. 1 of the Rotary Engine Company, 135 South street, Philadelphia. This company are exploiting the Warren rotary steam engine, whose construction and operation are described at length and illustrated very fully in the present pamphlet. The adaptation of this rotary engine to driving electrical generators by direct connection is discussed, and data are given relative to generating sets constructed upon this principle.

Coal Washing Machinery.—Catalogue No. 52 of the Jeffrey Mfg. Company, Columbus, Ohio, 9 x 7 inches in size, and embracing 76 pages. The title indicates the contents of this catalogue, consisting of a large number of views of coal washing installations made by the Jeffrey Company, and including also illustrations of various items of machinery used in equipments of this nature.

Roller Shaft Bearings.—The Hyatt Roller Bearing Company, Harrison, N. J., have issued a 6½ x 8¼ inch, 64-page bulletin, No. 20, which shows a number of applications of Hyatt bearings to actual installations, involving heavy duty at slow speed. The Hyatt flexible rollers are shown in use in traveling crane truck wheels and in similar positions, where their adaptability to the conditions named cannot but receive severe tests.

Transformers.—Bulletin No. 65 of the Wagner Electric Mfg. Company, St. Louis, is a standard size, 6 x 9 inch, leaflet of eight pages, very nicely printed, and setting forth quite fully the construction of lighting and motor transformers made by this company.

Traveling Cranes.—The Northern Engineering Works, Detroit, Mich., have published their catalogue No. 18, showing hand and power traveling cranes, designed with special reference to the requirements of power plants, pumping stations and similar places where use of the crane is intermittent rather than practically continuous, as in the case of manufacturing plants.

Stone Working Machinery.—A collection of standard size, 9 x 6 inch, circulars, covering a considerable proportion of the line of stone working machinery built by the Lincoln Iron Works of Rutland, Vt. Sawing machines, planers, polishing tables and other machinery connected with stone working are included.

Steam Automobiles.—A 6¼ x 9¼ inch, 16-page pamphlet, issued as Bulletin No. 1 of the White Sewing Machine Company, Cleveland, Ohio, referring to the line of steam automobile vehicles manufactured by the company. This Bulletin No. 1 refers particularly to the steam touring car, which it illustrates and describes very fully.

Elevator and Power Transmission Machinery.—Catalogue D of the Minneapolis (Minn.) Steel & Machinery Company measures 5½ x 7½ inches in size, and consists of 214 pages, within which are listed the usual items of equipment which should be expected in a complete line of power transmitting, elevating and conveying machinery. The catalogue is well arranged, neatly printed and, except for its odd size, is a credit to the company by whom it is issued.

Centrifugal Pumping Machinery.—The Kingsford Foundry & Machine Works, Oswego, N. Y., have ready for distribution an exceptionally fine catalogue, in which are illustrated and described the various forms and types of Kingsford centrifugal pumps. The catalogue is of standard size, 9 x 6 inches, and consists of 64 pages, well filled with matter of direct interest to all who have to deal with machinery of the class named.

Motor Operated Large Valves.—Bulletin No. 34 of the Northern Electrical Mfg. Company, Madison, Wis., is 7 x 10 inches in size, and consists of 16 pages, calling attention to the advantages of attaching motors by suitable gearing to sluice and gate valves of large size, so as to provide for quick and easy opening and closing. Various applications of this nature are shown, and the general subject is discussed at length. Accompanying the bulletin is booklet No. 33, 3½ x 6¼ inches in size, and dealing exclusively with the small types of motors built by the Northern Electrical Mfg. Company.

Milling Machines and Cutters.—The Hess Machine Company, Fifteenth and Chestnut streets, Philadelphia, have issued a standard size, 6 x 9 inch pamphlet catalogue of 24 pages, relating to their milling machines and milling cutters.

Machines of their manufacture are shown in several fine engravings, and their different types of milling cutters for fast feeding are illustrated and discussed. It is claimed that in working ordinary cast iron these cutters will rough out a width of 42 inches, taking a cut ½ inch deep, and traversing the work with a feed rate of 10 inches per minute. This is equivalent to the removal of 210 cubic inches, or about 54 pounds, of metal per minute.

Gasoline Engines for Oyster Dredgers.—A 6¼ x 5 inch, 36-page pamphlet, illustrating and describing the Automatic gasoline engines made by the Automatic Machine Company, Bridgeport, Conn. Not alone are the engines themselves described, but their application to the requirements of oyster dredging craft is also set forth at length. Illustrations show these engines arranged for driving the propellers of oyster dredging boats, and at the same time connected by suitable hoisting machinery to the dredging equipment itself. This is a very interesting application of the internal combustion engine.

The Belfont Iron Works Company, Ironton, Ohio, are sending out with the compliments of S. G. Gilfillan, secretary and treasurer, a handsome calendar for 1904. It is 12 x 17 inches and is printed in colors. The illustration used is one of the famous fencing girls, entitled "Waiting."

The Rollins Engine Company, Nashua, N. H., are sending out an attractive mailing card enumerating several points regarding which the Rollins engine "Stands Alone."

The R. D. Nuttall Company, Pittsburgh, Pa., are distributing a wall card giving a table of pitch diameters of gears for 1 inch circular pitch. This card suspended near the gear cutter should be of service to the operator of the machine.

The Phinotas Chemical Company, 237 Front street, New York, has recently mailed to the trade a card asking "How Many for You?" The question relates to the Phinotas flush tank disinfectors, of which the statement is made that nearly 1000 are in use by a single New York corporation.

The Joseph Dixon Crucible Company, Jersey City, N. J., have published a 24-page pamphlet of suggestions relative to the use of their various graphite products.

The Allis-Chalmers Company, New York Life Building, Chicago, in their Catalogue No. 62 present an imposing list of foreign users of engines built by them.

The Colonial Steel Company, 201-203 Lake street, Chicago, have issued a 32 page pamphlet of standard size, 3½ x 6 inches, giving a classification list of their products, with tables of weights and gauges, as well as a list of sizes of materials carried in stock at their Chicago warehouse.

The Sawyer-Man Electric Company, New York City, in their folder No. 4014 give some suggestions for those who use incandescent lamps. The pamphlet is standard size, 3½ x 6 inches, and includes within its 28 pages an instructive discussion of the subject of incandescent lamp economy.

The Prentice Brothers' Company, Worcester, Mass., have published a very attractively printed pamphlet bearing the title "Radial Efficiency," and setting forth the merits of the radial drilling machines made by the company.

The Alliance (Ohio) Machine Company are distributing a four-page leaflet relative to their standard cranes and giving a list of firms to which machinery of this class has been supplied.

The American Blower Company, Detroit, Mich., is out with booklets Nos. 39 and 42, the former referring briefly to the "A, B, C" moist dry air kiln apparatus, the latter to various items of its product for heating, ventilating, drying and for mechanical draft.

The Bourse, Philadelphia, sends out "with best wishes for the new year," a memorandum calendar with a separate detachable leaf for each week of the closing month of the present year and for the whole of 1904.

D'Olier Engineering Company, Philadelphia, has provided firms on its mailing list for bulletins a substantial and convenient binder in which these bulletins may be preserved for reference.

The Canton Foundry & Machine Company, Canton, Ohio, recently distributed a mailing card relating to the Universal ball bearing turntable made by them.

Arthur Koppel, 66-68 Broad street, New York, has issued a supplement to his catalogue No. 77, of narrow gauge railway material and supplies.

The Hawkins Steel Process Company, Majestic Building, Detroit, Mich., have prepared for distribution to interested parties a standard size, 6 x 9 inch, pamphlet relating to the Hawkins pneumatic filtration process for the manufacture of steel.

The Warren Brothers Company, Postal Telegraph Building, New York, have issued a pamphlet on "Successful Paving Methods," as exemplified in their "Bitulithic" pavement. The contents consist of reprints from the columns of recent numbers of *Municipal Engineering*.

The Municipal Engineering & Contracting Company, Chicago, issue a folder, illustrated with half tones, showing their sewer excavating and trenching machines in operation. Their sewer excavating machine is built in sizes to dig sewers from 27 to 60 inches wide and as deep as 20 feet, and their wheel type trenching machines, for water and gas mains, have a capacity of trenches 30 inches wide and as deep as 6 feet. They reprint from the *Engineering News* an article by Clarence Coleman on the efficiency of concrete mixing machines and also give much other valuable information about the proper mixing of concrete.

HARDWARE.

AT the turn of the year, the juncture at which the trade now find themselves, there is generally, after the labor and pleasure of the holidays, the work of ascertaining the results of the business for the past 6 or 12 months. While the well informed business man usually knows pretty well how things have been going, there is more or less solicitude in regard to the final bringing together of the figures, on the one side or the other, which are to show in black and white the profits or the losses of the year. To do this accurately requires painstaking care and a good system, and to be willing to know the cold facts as liabilities are frankly ascertained and charged up, and assets remorselessly kept uninflated by doubtful or fictitious values, calls for a kind of candor and honesty with one's self in which some merchants and manufacturers, who are honest with other people, are not infrequently deficient. We trust that our readers are able to advise themselves definitely and truly in regard to the results of their business for 1903, and that the new year opens for them in the knowledge that they have received an ample return for their efforts. The fact that they are doing a profitable business should impart to them something of a cheerful and confident feeling as they enter upon the work of 1904.

It must be remembered, however, that the results of the year's work, even in a business way, are not all shown on the books. There may be a good profit for division or investment, and yet the condition of the business on the whole be far from healthful, and its results far from what they might have been. There may, on the other hand, be little to take out of the business, or little increased capital put into it out of its earnings, and yet the business itself be in a most satisfactory and promising state. There are some things which have a close relation to the success of the enterprise which do not find a place even in the most perfect system of modern bookkeeping. After the accounts of the ledger have given their ultimate figures, and it is known to a cent what the profits have been, it becomes the merchant or manufacturer to take stock and strike a balance of certain less tangible elements which enter into his affairs, but have a most important bearing on his real gains and losses.

Whatever the character of the business transacted, whether it be fabricating products for other people to sell again, or making merchandise of the articles so produced, it is becoming at this season when work is taken up anew, that there be an endeavor frankly to ascertain not only how much money has been made, but how things are going in matters, which while they cannot be put down in dollars and cents, have potent influence in trade. A machine is not to be judged so much by its record as by its present condition and its adaptability to do the work required of it. Let the merchant or manufacturer in somewhat similar spirit judge the work of 1903 as he applies to his business tests which have to do with its present efficiency and its ability to give a good account of itself in the future.

Those in charge of business interests are sometimes content if they are simply holding their own year by year. Very often this is retrogression and falling behind, inasmuch as they do not keep up with the progress around them. The relative position in the trade is one of the factors which enter into a complete statement of the result of the year's activity. The improvement which is

made of opportunities and the use of facilities for securing profitable trade, either in making or selling goods, should be carefully studied, and if there is anything like a growing neglect and failure to do the best under the circumstances, it is a sure mark of deterioration and must be put down in this summary of the real condition of things as one of the liabilities which must be reckoned with as diminishing the value even of capital invested, and increasing the percentage of general expense in the transaction of the business. There should be, too, an earnest endeavor to estimate correctly the spirit and tone which are characteristic of the establishment. Some concerns doing even a good business are comparatively inert and sluggish with slipshod methods, and without the harmonious effort and enterprise which are found in a well ordered business in which a proper *esprit de corps* prevails. It behooves those in direction to take stock of qualities, good or bad, which are found in the business, and if things are going in the wrong way and the spirit of the whole establishment is deteriorating there should be a heavy writing off analogous to the charges in manufacturing plants for deterioration in machinery.

Those charged with the responsibility of direction in the management of business are not, however, to give all their attention to their subordinates, or even to their methods. The course of trade in these days of consolidations has emphasized the supreme importance of personality as a directing and ruling power. The merchant or manufacturer, coldly taking stock of himself, should find out whether or not he is advancing or retrograding as a business man. If the directing power, the ruling spirit, is losing in practical efficiency, it matters little what the balance sheet shows. Things are not going well. The measure of skill or judgment which is at the service of the business, the ability to meet emergencies, the resourcefulness in devising new methods or channels of trade, the personal qualities which call out loyalty and enthusiasm, the faculty of uniting conservatism with enterprise and energy, and of supplementing recognized defects in himself with the abilities and services of others—these are matters which lie very near the secret of success and must be reckoned with in estimating the condition of the business. To this inventory of personal qualities, as well as the ascertaining of other elements of success, which cannot be expressed in financial equivalents, it is the part of wisdom for both merchants and manufacturers to give careful heed. This is, after all, the stock taking which has the most important bearing on the success of 1904 and the years to follow.

Condition of Trade.

The record which 1903 has made for itself is, on the whole, very satisfactory, and the various classes of the trade have had a profitable business. During the last half of the year the market has been one in which receding prices in the raw material have had something of a depressing effect, but the coming down has been recognized as normal and healthful, and viewed in its various relations advantageous on the whole. For several months past there has been an evident hesitancy on the part of the large trade in placing orders, as they have recognized that there was little danger that anything would be lost by waiting. Their course has certainly been justified, as there has been a gradual recession of prices, especially in heavy goods, and a revising of quotations in many miscellaneous lines in which some changes have been made of advantage to the buyers. With all this, the indications have pointed to a good business in 1904, and

with the closing of the year there is a perceptible improvement in the general feeling of the trade. With prosperous conditions in practically every section, with the apprehension of financial trouble over, with a growing export demand, and with signs of recovery in at least some departments of the iron market, the new year begins with promise of a large volume of business; and is, on the whole, in a very satisfactory condition. To our readers we extend the wish that it may be a happy and prosperous year.

Chicago.

(By Telegraph.)

Both wholesale and retail merchants are reaching the closing days of the year with a sense of satisfaction because it has been a year of exceptional activity and good profits. Business this week is naturally light, and annual inventories have begun both in retail and wholesale establishments. Holiday trade has broken all previous records, and the outlook for a large business in January is excellent. Prices, except in a few lines, are firm, with a tendency to strengthen. The affirmation of Steel prices on the part of the large producers has steadied the market and restored confidence. Set Screws and Machine and Carriage Bolts are offered in this market at about 10 per cent lower prices than a month or two ago. Stove Bolts are still held at 80, 10, and 5, with additional discounts or rebates for quantities. The association price on plain Wire Rope is still nominally 45 and 2½ per cent. discount from list in the Chicago market. Independent producers are not always adhering to the policy of quoting discounts from list, but ascertain the quantity and size desired by the customer and quote accordingly net prices equivalent to a considerably better discount on certain sizes and to large users. The car lot price on Manila Rope is 11½ cents per 100 pounds, and Sisal at 8½, both at base, Chicago, with the usual extras for sizes smaller than 7-16ths. A large independent producer states that his year's business just doubled the estimates made a year ago.

St. Louis.

(By Telegraph.)

The Hardware jobbers have been unusually busy the past week, having to divide their attention between fulfilling the generous flow of orders of the outside trade and the annual inventory requirements. Weather conditions have been favorable to increasing activity in certain classes of winter supplies and the aggregate quantities of Stove goods, Weather Strip, Snow Shovels, &c., have been large. A considerable volume of orders for early spring supplies has been attended to, and traveling forces are anticipating big demands following the holiday season. Wire Cloth has shown a pronounced tendency to hardening in price, due to the peculiar circumstances pointed out in this column a short time ago.

NOTES ON PRICES.

Wire Nails.—As usual as this season, demand is light. Indications point to an active trade in the spring. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....	\$1.85
Retailers, carload lots.....	1.90
Retailers, less than carload lots.....	2.00

New York.—There is naturally but little business during holiday week. Jobbers have reduced prices to correspond with lower prices from mill. Quotations are as follows: Single carloads, \$2.00; small lots from store, \$2.10.

Chicago, by Telegraph.—The act of the leading producer in making public the present price, although but little more than a confirmation of the same price made for some weeks previous to favored buyers, is resulting in a multitude of orders from the smaller buyers who had not formerly been acquainted with the lower prices. These added to the orders and specifications on the part of large consumers are keeping the manufacturers of Wire Nails extremely busy. The following are prevail-

ing quotations: To jobbers in car lots, at Chicago, \$2, base, per 100 pounds; to retailers in car lots, \$2.05; to retailers in less than car lots, \$2.10 to \$2.15.

Pittsburgh.—Current business in Wire Nails is light, as it always is at the close of the year. Buyers are placing orders only for small lots for actual needs, but we are advised that a number of contracts have been placed for spring delivery. For such business the manufacturers guarantee prices against decline on unfilled portions of the contract. We quote Wire Nails at \$1.85 in carloads and \$1.90 to \$1.95 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails.—Demand at present is quiet, orders being for small lots to cover immediate requirements. Quotations are as follows: \$1.90, base, in carloads, and \$1.95 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

New York.—During the past week demand has fallen off to some extent, as compared with past month or more. Quotations are as follows: Carloads on dock, \$2.04½; less than carloads on dock, \$2.12½; small lots from store, \$2.20.

Chicago, by Telegraph.—Pending the meeting of the Cut Nail Association no changes in price are authorized, although it is safe to assert that large jobbers in Chicago are buying Cut Nails at \$1.95 to \$2, base, per 100 pounds in car lots, while the official price remains at \$2.06½.

Pittsburgh.—Demand for Cut Nails is only fair, and is for small lots only. Manufacturers expect a larger demand after the first of the year when buyers commence to place orders for spring trade. The official price on both Steel and Iron Cut Nails continues to be shaded about 5 cents a keg on good orders. We quote Steel and Iron Cut Nails at \$1.90, base, in carloads and \$1.95 in less than carloads, plus freight in Tube Rate Book to point of destination, less 2 per cent. off in 10 days.

Barb Wire.—Orders are for small lots, and demand continues light. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Chicago, by Telegraph.—This has been naturally a dull week in this product, although somewhat more active than the fifty-second week of other years. Retailers pay \$2.20 for Plain and \$2.60 for Galvanized, with an advance of 10 cents per 100 pounds in less than car lots.

Pittsburgh.—Current demand is light, buyers placing orders only for actual needs. After the first of the year contracts for spring delivery will likely be placed and a larger demand is anticipated. We understand prices are guaranteed against decline on unfilled portions of contracts. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Smooth Fence Wire.—Demand is good considering the season, with indications of an increase early next year. Prices are somewhat irregular, but the following quotations fairly represent the market, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.80
Retailers, carloads.....	1.85
Less than carloads.....	1.95

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed... Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized... \$0.30	.35	.40	.45	.55	.65	1.05	1.15		

Chicago, by Telegraph.—The announcement last week of an official price of \$1.90 per 100 pounds in car lots to jobbers at Chicago has stimulated buying among the smaller dealers, who had not been informed of this reduction made by the leading producers. Less than car lots

are sold at \$2 per 100 pounds, either from mill or store, with an extra for Galvanized of 30 cents per 100 pounds for Nos. 6 to 14, and 60 cents per 100 pounds for Nos. 15 and 16.

Pittsburgh.—Demand is not heavy, but is expected to be larger after the first of the year. The mills are guaranteeing prices against unfilled portions of contracts. We quote as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days: Plain Wire, \$1.75, base, for Nos. 6 to 9 in carloads to jobbers, and \$1.90 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14, and 60 cents extra for Nos. 15 and 16.

Cordage.—Demand is light, and factory salesmen are off the road until after the first of the year. Quotations on the basis of 7-16 inch diameter and larger are as follows: Pure Manila, 11½ cents; second-grade Manila, ½ to 1 cent per pound lower; Pure Sisal, 9¼ cents; Mixed Sisal, 8 cents per pound.

Lamp Wicks.—Under date December 15 the Wick department of the Standard Oil Company, 26 Broadway, New York, issue revised price-lists on Lamp Wicks. The new list is subject to a discount of from 60 to 60 and 10 per cent.

Floor Hinges.—The Lawson Mfg. Company, 40 Dearborn street, Chicago, issue a notice under date December 15 announcing that all quotations on Floor Hinges have been withdrawn, and offering to name new discounts on application.

Glass.—Matters have been quiet in Glass circles during the week, pending the completion of arrangements toward the formation of the Manufacturers' Window Glass Company. A meeting was called for December 29. The scheme was abandoned for lack of support. According to press reports, a New Jersey charter was granted the company early this week, with a capital of \$1,000,000.

Oils.—*Linseed Oil.*—Demand continues light, and for immediate delivery. While no change in quotations has been announced, there appears to be a little weakening in out of town Oil for large lots, immediate delivery. Quotations are as follows: City Raw, in lots of five barrels or more, 37 cents; in lots of less than five barrels, 38 cents per gallon. Out of town and Western Oil, 35 to 36 cents per gallon.

Spirits Turpentine.—The market does not show much activity at this point. Quotations are as follows, according to quantity: Oil barrels, 59¼ to 59½ cents; machine barrels, 59¼ to 60¼ cents per gallon.

STOWELL MFG. & FOUNDRY COMPANY.

STOWELL MFG. & FOUNDRY COMPANY, South Milwaukee, Wis., are announcing a guessing contest which is open to the farmers and Hardware and Implement dealers of the country. The company will give \$100, divided into 14 prizes, to the persons sending the largest list of words made up from the letters comprised in "Stowell Hay Tools," Webster's dictionary being the accepted authority. The contest closes on March 1 next. This contest is being advertised in the leading farm journals of the country, and the company expect in this way to bring the competition and their products to the attention of farmers throughout the country. The company also announce that W. S. Deighton, late division sales manager for Milwaukee division, International Harvester Company, has accepted a position with them as their special representative in Missouri, Kansas, Oklahoma Territory, Indian Territory and Texas, with headquarters at Kansas City. They have secured floor space in convention hall for the annual gathering of the Western Retail Implement and Vehicle Dealers' Association in January, and Mr. Deighton will be on hand with a line of Hay Carriers, Slings, Forks, &c., as well as a full line of their Parlor and Barn Door Hangers and Fixtures.

RICHARDS & SENCENBAUGH MFG. COMPANY, Aurora, Ill., under date December 18 announce that after a tem-

porary suspension they have resumed business with new capital sufficient to enable them to manufacture and sell at fair prices the Richards hardware specialties. They state that no other manufacturer is authorized to use the name Richards in connection with the goods formerly and now made by them.

JAMES H. GILHULY.

JAMES H. GILHULY, for the past 24 years with the Dunham, Carrigan & Hayden Company, San Francisco, Cal., will embark in business on his own account, in that city, as a manufacturers' agent, January 1. Mr. Gilhuly has been connected with the above house for a period of 24 years, starting as office boy and working his way up to the position of buyer and manager of stock department. He has been in the East for the past three months visiting the principal manufacturers in his line, and has succeeded in making arrangements with a number of well-known houses to represent them to the Pacific Coast trade. Mr. Gilhuly will have the best wishes of his old employers and many friends for his success in his new departure.

I. E. PALMER'S CATALOGUE.

I. E. PALMER, Middletown, Conn., issues a 1904 catalogue, illustrating in colors his entire line of Hammocks, &c., including his new Embroidered Hammocks. Many entirely new and patented designs of Hammocks, of new weaves and colors, are also shown. A new Trapeze Suspension Bar is shown, which can be used in swinging a Hammock where a single tree is available, and from which it is seldom possible to obtain two points of uniform light. The Bar may also be used on verandas. A new Clamp Joint Hammock Support is also being introduced for the coming season.

TRADE ITEMS.

THE SMITH & HEMENWAY COMPANY, 296 Broadway, New York, have contracted with the Page-Storms Drop Forge Company to handle the entire marketing of their Engineers' Wrenches. In addition to manufacturing Drop Forged Engineers' Wrenches, the Page-Storms Company make a specialty of manufacturing Forgings from blue prints or samples for any one desiring this class of work. Parties interested or wishing to have such forgings made may make their requests direct to the factory, at Brightwood, Mass.

HARRY HAWKINS, formerly with the American Mfg. Company as Southern salesman, will hereafter look after the same trade and territory for the New York Cordage Company of 83-85 Wall street, New York. Charles M. Albertson, recently New York City salesman for the American Mfg. Company, will, after January 1, represent the New York Cordage Company in the same capacity.

TAUNTON RIVET COMPANY, Taunton, Mass., advise us that while their plant was quite badly damaged by fire on Christmas morning, their power and manufacturing departments are running as usual. The fire was confined to the finishing, packing and shipping departments, for which other arrangements will be made, so that the company do not anticipate more than a few days' delay in filling orders.

EARLY in January the Sun Mfg. Company, Greenfield, Ohio, manufacturers of Cash Registers, Combination Showcases, Money Drawers, Coffee Mills, Wooden Ware Specialties and Rat Traps, will remove to their new factory at Columbus. Here they will have greatly increased facilities for handling their growing business. The new plant is a three-story brick fire proof building, 100 feet wide by 260 feet long. By locating in Columbus the company point out that their factory will be not only convenient to far better transportation facilities than in its present location, but they will also have the benefit of being in a larger manufacturing center, with better railroad rates, together with other advantages not now enjoyed. The company will issue a new complete catalogue of their products about January 10.

FACTORY COST AND BUSINESS METHODS.

THE COST SYSTEM OF ROMER AXE COMPANY.

Concluding Article.

The Romer Axe Company's description of their Cost System is concluded below.

ARRANGEMENT AND USE OF COST LEDGER.

As already explained, we keep an auxiliary or Cost Ledger in which we have material and expense accounts corresponding with those in the general ledger. These accounts not only show the total expenditures for each item (agreeing with the corresponding accounts in the general ledger), but each account is also credited monthly with the actual or estimated amount consumed in the production of the goods turned out.

Fig. 7 illustrates a page of our Cost Ledger, showing the account with "Poll Steel," the first item on the debit side showing the value of this material on hand

Poll Steel									
1903									
Jan 1	Inventory	12,372.50	Feb 1	Inv. Consumed	5.50	12,367.00			
Feb 1	Purchase	5.50	Mar 1	"	5.50	12,372.50			
Mar 1	"	5.50	Apr 1	"	5.50	12,372.50			
Apr 1	"	5.50	May 1	"	5.50	12,372.50			
May 1	"	5.50	June 1	"	5.50	12,372.50			
June 1	"	5.50	July 1	"	5.50	12,372.50			
July 1	"	5.50	Aug 1	"	5.50	12,372.50			
Aug 1	"	5.50	Balance			12,372.50			
Aug 1	Balance	12,372.50							

Fig. 7.—Page of Cost Ledger, Showing Account with Poll Steel. Size of Page, 7 1/4 by 12 1/2 Inches.

according to the last actual inventory and the successive debit charges the invoice value of all new purchases since inventory, including, of course, all freights and costs of handling. The several entries on the credit side represent the value of this material consumed month by month. The debit balance obviously shows the value of the material on hand at any given time. It will be understood that a similar account is kept with each of the other kinds of material or expense mentioned in the above list.

Fig. 8 illustrates in a similar manner the ledger account with "Manufactured Stock," the debit charges representing the total value of all the materials consumed

Manufactured Stock									
1903									
Jan 1	Inventory	2,323.61	Feb 1	Shipments	5.50	2,318.11			
Feb 1	Purchase	5.50	Mar 1	"	5.50	2,323.61			
Mar 1	"	5.50	Apr 1	"	5.50	2,323.61			
Apr 1	"	5.50	May 1	"	5.50	2,323.61			
May 1	"	5.50	June 1	"	5.50	2,323.61			
June 1	"	5.50	July 1	"	5.50	2,323.61			
July 1	"	5.50	Aug 1	"	5.50	2,323.61			
Aug 1	"	5.50	Balance			2,323.61			
Aug 1	Balance	2,323.61							

Fig. 8.—Page of Cost Ledger, Showing Account with Manufactured Stock. Size of Page, 7 1/4 by 12 1/2 Inches.

and the expense incurred in turning out the product, while the credits show the cost value of all the manufactured stock shipped as determined by our "Cost of Shipments" book, referred to later on. The difference between the two sides of this account gives us the cost value of manufactured stock on hand. This system as briefly outlined gives us a practically correct inventory

on the first of each month of all materials and supplies on hand.

RECORD OF MONTHLY SHIPMENTS.

To arrive at the cost of the goods shipped and the profits or losses on shipments each month we use a book

COST OF SHIPMENTS FOR MONTH OF July 1903										NO. 37															
DATE	DOZENS	DESCRIPTION	WEIGHT	FULL STEEL		BUTT STEEL		PIEL		BOXES	MIL. SUPPLIES		GREYDITORS	BERRY & POL. LUP.		PTG. & PAUL. LUP.		PIEC. LABOR		VOT. POSITIVE COST		BOXES		HANDLES	
				Weight	Price	Amount	Weight	Price	Amount	Per Doz.	Amount	Per Doz.	Amount	Per Doz.	Amount	Per Doz.	Amount	Per Doz.	Amount	Per Doz.	Amount	Per Doz.	Amount	Per Doz.	Amount
9 March	1500	Regular (Bent) Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
10 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
11 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
12 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
13 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
14 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
15 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
16 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
17 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
18 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
19 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
20 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
21 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
22 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
23 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
24 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
25 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
26 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
27 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
28 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
29 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
30 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
31 March	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
1 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
2 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
3 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
4 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
5 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
6 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
7 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
8 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
9 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
10 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
11 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
12 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
13 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
14 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
15 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
16 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
17 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
18 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
19 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
20 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
21 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
22 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
23 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
24 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
25 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
26 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
27 April	1500	Black Sps. 100	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500					

ing out the costs in exactly the same manner as in figuring the cost of goods produced.

This record of cost of shipments in the month of July is shown in the accompanying illustration, Fig. 9. This assembling of the various partial results at the end of each month is the work of but a few moments and brings the whole thing into a nut shell. In other words, by taking the balances of less than two dozen accounts in our Cost Ledger we are able to show the total amount expended for material, labor and expense of all kinds, the value of all material and manufactured stock on hand, the total sales, and the profits or losses realized on the goods shipped.

GENERAL EXPENSE CHARGES AGAINST MONTHLY SHIPMENTS.

As the percentage which "General Expense" bears to "Positive Cost" will vary more or less from month to month, care must be taken in making the general expense charge against each month's shipments to see that the average percentage is maintained. The following, as shown in Fig. 9, will illustrate how we arrive at this:

Total Positive Cost of all goods produced to date	\$55,000.00
Total General Expense to date	11,000.00
Average percentage of General Expense to Positive Cost	20 per cent.
Total Positive Cost of all goods shipped to date	\$51,412.50
General Expense, 20 per cent. of above	10,282.50
Amount previously charged up to shipments on account General Expense	8,651.33
Amount of General Expense to be charged up this month to balance	1,631.17

After ascertaining the total cost of the month's shipments as above described an entry is made in our Cost Journal as follows, covering the cost of shipments during July:

Axe Shipments, Dr.....	\$10,000.00
To Manufactured Stock.....	10,000.00

Finally the following entry is made, covering invoice value of July shipments:

Total Sales, Dr.....	\$11,000.00
To Axe Shipments.....	11,000.00

It will readily be seen that after all these entries have been posted to the proper accounts in the Cost Ledger the difference between the two sides of the various material accounts will show the inventory value of stock on hand, while the "Axe Shipments" account will show the profit or loss, the debit side of the account showing the cost of the shipments and the credit side the price at which they were sold.

DEPRECIATION OF PLANT.

The question of depreciation we do not attempt to figure monthly as a part of the manufacturing cost, preferring to make what we consider a proper allowance for same when closing our books at the time of taking our annual inventory. We are careful, however, to charge *everything* in the nature of repairs during the year directly to general expense, so that no additions shall be made to our equipment accounts except such as are *bona fide* additions to our plant.

DISTRIBUTION OF GENERAL EXPENSE.

In the distribution of general expense we prefer the percentage method as herein described to any arbitrary method. It may not give the exact relative cost of each grade of goods under all possible conditions, but the same may be said of any other method. The principal point, we believe, is to make sure that every dollar of expense is charged up to date against the goods produced, and if this is done the exact distribution of the expense is of minor importance.

LITTLE LABOR INVOLVED IN OUR COST SYSTEM.

Perhaps a word regarding the amount of work necessary to keep up this system may not be out of place. We

believe that in any business employing not over 100 hands all of the necessary work can be kept right up to date without the addition of any extra clerical help. At least this is true with us, but we have found the results so correct and so valuable to us that we would not hesitate at incurring any reasonable expense for extra clerical help should it be found necessary.

ROMER AXE COMPANY.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses:

FROM LACROIX & LEGER, 251 Avenue Mont-Royal, Montreal, Canada, importers of Blacksmiths' Supplies, Paints, Oils, Varnish, &c. They request copies of new catalogues and price-lists issued at this time by manufacturers of the above lines.

FROM KNIGHT & WALL COMPANY, Tampa, Fla., who advise us that while in the past they have carried only a fair line of Supplies, their trade being limited to coast-wise steamers and phosphate plants, with the advent of the lumbering industry conditions have changed, and they expect in the future to carry a full line of Mill Supplies. They will accordingly be pleased to receive catalogues, discount sheets and freight rates to Tampa covering this line of materials.

FROM CLARK BROS., Coffeyville, Kan., who request catalogues and quotations relating to Shelf and Heavy Hardware.

FROM MAYO BROS., who about January 10 will open up a General Hardware business in Wilson, N. C., carrying also a full line of Paints, Oils, Glass, Stoves, Builders' Supplies, &c. The new firm will consist of E. B. Mayo, J. L. Mayo and W. C. Mayo. E. B. Mayo, the senior member, is now, and will continue to be, a member of the firm of Mayo & Watson, who will continue to conduct their business at their old stand.

FROM WM. WARNOCK, who has bought out the Coombs & Inwoodstad Company, Sioux City, Iowa, and will continue the Hardware, Sporting Goods, Furnace, Harness, Agricultural Implement, Vehicle and Paint business at the old stand. Mr. Warnock also conducts a store at Battle Creek.

FROM SOUTHERN MILL, MINE & RAILWAY SUPPLY COMPANY, Nashville, Tenn., who have just been incorporated and will begin business February 1 at 214 Court square. Their purpose is to carry a complete assortment of supplies of every variety, and in quantities sufficient to supply the wants of the rapidly developing coal mines, phosphate mines, saw mills, planing mills, oil and cotton mills in their territory. They will also engage in the manufacture of leather belting and small machinery, and will be in a position to supply the wants of the trade promptly, as they will confine themselves strictly to these lines, taking in, of course, and paying especial attention to, railway supplies, contractors' and machine shop supplies, and will have in connection with their business an engineering department, whereby plans and specifications can be furnished to promoters of municipal plants, electric light plants, water works, &c. The officers of the company are: W. H. Fickling, president and general manager; F. J. Fuller, secretary and treasurer; B. F. Soper, second vice-president, and D. Thomas, third vice-president. Mr. Fickling will sever his connection with the Gray & Dudley Hardware Company January 1 to take charge of the new business. The new corporation desire catalogues and price-lists from all manufacturers in their line.

THE BINDLEY HARDWARE COMPANY of Pittsburgh have bought the old Banner flour mill, on Main street, Allegheny, to be used as a warehouse.

PERSONAL LETTERS.

IT is not necessary for merchants to do things in the conventional way to insure success, or to sacrifice individuality to produce satisfactory results. This is forcibly shown in the forms of letters which follow, all of which are designed to attract a certain class of trade.

A large Eastern concern send the following letter in a plain envelope to people who have recently been married, the names being taken from the wedding notices in the newspapers. The idea is that if Mary Brown is married to John Smith, this letter will be the first one she receives as Mrs. Smith, and will naturally excite some interest.

The First Letter.

Dear Madam:

Below you will find a small list of House Furnishing Goods which we hope may be of benefit to you in selecting the necessities for housekeeping. Of most of these goods there is such a variety it is impossible to state the price until you see them. We are making a specialty of fitting a house complete in this line. We carry the best of everything, also the cheaper articles that are reliable, and we assure you the prices are the very lowest.

The "small list" which follows includes some 150 articles suitable and necessary for housekeeping.

The concern have used this form of letter for a number of years, and time and time again the lists have been brought in by people from which to make up their entire kitchen ware outfit.

More Effusive.

The second letter is Western origin and does not hesitate to combine sentiment with business:

Kind Friends:

Am pleased to know that your hearts have been united in the holy bond of matrimony. Please accept my sincere congratulations with the hope that a life of happiness and prosperity awaits you. As an inducement to supply you with Housefurnishing Goods, I beg to offer you a special reduction from our already low prices on every article we keep. If but a few items are needed you shall have them below regular prices. Besides Stoves and Kitchen Furnishings, we keep Dishes, Glass Ware, Tinware, &c. We prepay freight to stations near here when Stove is purchased.

Awaiting your call and assuring you best treatment, I am, very sincerely yours,

Mention receiving this letter to the clerk in order to secure discount.

Individuality Prominent.

The third and last of this interesting series is from a Hardware concern located in Illinois. This form is obviously designed "for whom it may concern," and is as follows:

Our attention was called to an account of your marriage by a notice in the evening paper. The ——— Hardware Company wishes to extend to both of you sincerest congratulations.

After the wedding comes housekeeping, and housekeeping means a Stove, Kitchen Furniture and things of like character.

We desire to call your attention to the fact that the ——— Hardware Company have been furnishing outfits to newly married couples for 20 years or more, and we are getting to be old hands at the business. We know just about what a newly married couple need.

First, a ——— Steel Range, which, by the way, is peculiarly a ——— institution, and there is no better Range made. It is a most durable Stove, a splendid baker, and we remind you of that old saying, "The way to reach a man's heart is through his stomach." Then the Kitchen Utensils, a Carpet Sweeper, Food Chopper, Knives and Forks, a Carving Set, these and many more things for the table.

For wash day, a Washing Machine, a Clothes Wringer, Ironing Board, Sad Irons, &c.

The ——— Hardware Company will be more than pleased to have you call and look over their immense stock of "Needfuls for the Newly Married."

THE ——— HARDWARE COMPANY.

The Follow-Up System.

Some merchants watch the newspapers for notices of births, and after a suitable period has intervened, mail literature to the fond parents calling attention to their stock of Baby Carriages and Go-Carts.

Those who have followed the practice of writing personal letters, along the foregoing and other lines, are a unit in declaring that it is a most efficient method of advertising, and at the same time the least expensive.

HARDWARE STORE WINDOW ARRANGEMENT.

BY JOHN J. DOWNEY.

ATTRACTIVE window displays not only catch the public eye, but show and convince it that the proprietors of the store are always studying their patrons' wants. Well may it be said that the contents of the interior stock may be judged by the show on the exterior of the salesrooms. If strict attention is paid to the pushing of an article through the medium of the show window there will be no room for a question, but that there will be increased sales. In a composition window how often has this remark been overheard from one of the bystanders: "I didn't know they kept this or that." What is the consequence? A call is started and a sale results.

Mistakes.

The most common of all mistakes in Hardware displays is lack of symmetry. A catchy display of Tools is often ruined by overcrowding or by a background of Kitchen Utensils, and likewise a kitchen display is ruined by a background of sanitary articles. In the majority of windows, when Brushes are displayed on the floor of the window the background is made up of Garbage and Ash Cans; or a display of Cabinet Mantels with a beautiful tiled open fire place is frequently spoiled by having as space fillers Gas and Coal Oil Heaters, and so on might be quoted many other examples of lack of taste and, undoubtedly, symmetry.

Fixtures

Steps are one of the most economical features for show window use. These may be made so that each step is detachable from the others. It is unwise to build these of solid sleepers, for they are very troublesome to remove from a window. In placing steps care should be taken that the goods on the top shelf are not above the level of the eye of the observer. When using steps all space above the top shelf should be covered with articles related to the contents of the base of the window and shelves. A background adopted by most of our leading Hardware stores for covering show windows is black canton flannel with the fleece against the wood. The best lighting effect is received from electric lights directly over the glass, the lights running parallel to the ceiling. They should be surrounded by reflectors, so that a brilliant light will be cast over the window. If electric lights are not used a good soft light is secured by the use of Welsbach burners.

Care of Goods in the Window.

A show window should always be kept closed from the dust that arises from the sweeping of the store. Bends around the glass should be kept as air tight as possible. When Saws and all other Tools made of bright steel are kept in the window they should receive a coat of melted paraffine wax. This will protect them from rust, and when they are taken from the window a special endeavor should be made to dispose of them at an early opportunity.

Price Cards and Newspaper Advertising.

Neatly made price cards of a uniform size will save the observer the embarrassment of asking prices of goods beyond his means. Advertising is necessary. Many small houses cannot afford a half column in a daily paper, but if they will make their window the paper and their stock the advertisement success is bound to come and after a short while they will be able to insert an ad. in one of the town papers. It may not be a half column, but it won't take long for sales and stock to warrant more extensive advertising. Never let competition keep price cards of a unique design out of your window, but solicit competition and you will be forever catering to advancement.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,
NORFOLK ST., LONDON, W. C., Dec. 19, 1903.

General State of the Hardware Trade.

FACTORIES and workshops are just now sending off final shipments prior to the Christmas holidays, and this done, the future is by no means clear. My reports for some weeks past have, unfortunately, been on the bearish side, and the official report as to the state of trade during November bears out my weekly assertions. The following statement tells its own story:

Brass Work, Bedstead Making, &c.—Employment among Brass workers is much the same, on the whole, as a month ago, though rather worse than a year ago. At Birmingham it remains fair in the various branches of the trade. At Rotherham it is quiet; at Doncaster, Manchester and Nottingham, slack; in London, fair on the whole. In Birmingham employment is bad in the Bedstead trade and moderate with Fender makers.

Nuts, Bolts, Nails, &c.—In Birmingham and at Smethwick employment is reported as quiet with Nut and Bolt makers, and with makers of Cut and Wire Nails and Machine Made Rivets. At Dudley it is reported as fair with Nut and Bolt makers. At Halesowen and Blackheath employment is fair with makers of Spikes, Wrought Nails and Rivets. At Leeds employment with Nail makers is improving.

Tubes.—Employment has somewhat improved during the month, but is worse than a year ago, and there is some short time worked. In Birmingham the Cased Tube section is reported as improved.

Chains, Anvils, Vises, Anchors, &c.—Employment is reported as fair with Block Chain makers at Cradley, but as quiet with makers of Dolled Chain and Cables. In the Anvil and Vise making trades employment generally is slack, but Anvil makers at Dudley report it as fair. Anchor smiths at Cradley report employment as quiet. In the Spring trade at West Bromwich employment is good. With makers of Bits, Stirrups, Case Hames, &c., at Walsall it is slack. At Wednesbury employment is reported as fair on Iron and Steel Forgings, but as slack with workers on Railway Axles, Springs and Coach Iron Work. In the Axle trade at Birmingham employment is reported as good.

Locks, Keys and General Hardware.—Employment in the Lock, Key and Latch trade is reported as fair in some branches and bad in others; it is worse than a year ago. In the Wrought Iron and Steel Hinge trade at Birmingham employment is reported as very good, overtime being worked. In the Hollow Ware trade employment is moderate at Birmingham, but at West Bromwich it is slack, and short time still continues. At Wolverhampton light Enameled Hollow Ware makers, makers of Plantation Hoes and Vermin Trap makers report employment as good. Employment is good with electrical and malleable casters at Oakengates. Spade finishers and Fork drawers, galvanizers, Hurdle and Fence makers and Spectacle Frame makers report employment as fair.

Files, Edge Tools, &c.—In the File trade at Sheffield employment generally is very quiet. At Birmingham File cutters report it as very fair. In the Edge Tool trade employment is fair at Birmingham, good at Wolverhampton, slack at Sheffield.

Stoves, Grates, &c.—Employment generally is reported as very quiet in the principal centers of these trades.

Sheet Metal.—In the London district employment is reported as fair and better than a month ago with Sheet Metal and Gas Meter workers, bad with Canister makers, good with Zinc workers. At Birmingham employment is fair, but it is bad at Wolverhampton, Bilston and the Lye district. It is slack in Manchester and Dublin, but fairly good at Sheffield, Leeds, Hull, Nottingham, Bristol, Exeter, Edinburgh and Aberdeen.

Cutlery, &c.—At Sheffield employment generally in these trades is reported as slack, except in the Pen and Pocket Blade branch. The Needle and Fish Hook trades at Redditch report employment as very fair and very good, respectively.

Gold, Silver, Britannia Metal, &c.—In London these trades generally report employment as fair, except small

Silver workers, with whom it is dull. At Sheffield employment is slack, Silver platers and gilders being the only exception and reporting employment as good. In Birmingham employment is improving in the Jewelry trade, fair in Britannia Metal Work, but quiet with electroplaters. Employment is bad in the Watch trade at Coventry.

Wire Work.—Wire drawers report employment as fairly good generally, but slack at Sheffield. Wire weavers as very good in London, but dull in Glasgow. Wire workers as quiet in London and Manchester.

Farriers.—Employment generally is reported as quiet, about the same as a month ago, slightly better than a year ago. It is, however, reported as good at Newcastle and Dublin and fair at Nottingham, Dundee and Aberdeen.

American Trade with British Possessions.

The British Commercial Agent in the United States, E. Seymour Bell, has drafted an interesting memorandum upon the extent of the trade between the United States and British possessions, from which the following is taken:

As there is every probability that manufacturers in the United States will soon be again looking for markets whereby they may export their surplus products, it may be as well to bring before British manufacturers and shippers in an unmistakable manner the progress that has been made in recent years by American shippers in securing a hold of trade in British possessions. This is particularly noticeable in certain classes of goods which from the nature of the manufacture ought and could come from the United Kingdom. Though the figures in this report may not be new to many, they are, perhaps, of sufficient importance to justify their being brought forward again so that British shippers may study carefully the conditions of those markets which are most vulnerable to attack from this side, and more especially those of the British colonies.

There has been such an increase in the means of production in the United States in order to meet the home demand, that now, when the domestic wants are more than supplied, and orders are becoming less plentiful, it will be necessary to export the surplus manufactures at a reduced price in order to keep the works running, or cease to pay dividends almost entirely, and thus bring ruin to a very large number of people.

That there will be an enormous overproduction in this country at no distant date there is every indication. During the past three years immense sums have been spent in extending and improving works all over the country to enable the manufacturers to meet the extraordinary demand for all classes of goods. The demand has already commenced to fall off, and when this becomes more pronounced there will be a congestion of manufactures which must be disposed of at almost any price. It has been said that the large trusts controlling, as they in some cases do, the market, will not allow prices to fall below a dividend paying level. That they will succeed in doing this is exceedingly doubtful. When there is not sufficient demand for their goods in the United States they must either shut down or export their surplus, as they have done previously. They will certainly make an effort to keep up prices in the home markets, as it is there that they make their profit, but they will be forced to sell at a greatly reduced price abroad in order to compete with other countries. Everything, therefore, points to the probability of the "dumping" process being carried out to a greater extent than has hitherto been done.

Statistics relating to trade between the United States and the United Kingdom are pretty well studied, but, perhaps, those relating to the exports from this country to British possessions are not so well known to, nor make their extent understood by, British manufacturers. From the following remarks they will, perhaps, be able to realize the seriousness of the competition they will have to meet when the "dumping" process really begins.

The year ended June 30, 1901, has been selected for comparison because it was the year when the exports from the United States exceeded those of any previous year. In that year the value of merchandise exported from the United States amounted to \$1,487,764,991. Of this amount \$189,256,292 went to British possessions, or 12.8 per cent. In the year ended June 30, 1902, the value of exports fell to \$1,381,718,401, of which \$197,993,571 went to British possessions, or 14.3 per cent.

During the last fiscal year the value exported was \$1,420,138,014, of which \$222,854,847 went to British possessions, or 15.7 per cent. From this it will be seen that while the value of merchandise exported from the United

States has decreased about 4.6 per cent., comparing 1903 with 1901, the value of goods exported to British possessions has increased about 17.6 per cent.

The following table shows the distribution of merchandise exported from the United States to British possessions during the 12 months ending June 30, 1901, 1902 and 1903:

	1901.	1902.	Increase or decrease, 1903, 1901-03.
Gibraltar	\$678,814	\$505,956	\$427,005 - 37.1
Malta, Gozo, &c....	438,982	321,251	453,529 + 3.3
Bermuda	1,314,007	1,490,868	1,327,626 + 1.3
British Honduras...	813,817	773,676	868,578 + 6.7
British No. America.	107,746,519	112,308,295	125,981,831 + 16.9
British West Indies.	8,876,052	9,714,963	10,137,055 + 14.2
British Guiana.....	1,734,404	1,954,394	1,936,524 + 11.6
British China.....	220	6,782	1,670 ...
British East Indies.	6,251,804	4,621,876	4,795,411 - 23.2
British Australasia..	30,726,687	28,375,199	32,748,580 + 6.6
British Africa.....	21,654,458	28,780,105	33,788,629 + 56.0
Aden	999,898	916,896	1,508,999 + 50.9
Hong Kong.....	8,009,848	8,030,109	8,780,741 + 9.5
British Oceania.....	15,982	193,201	98,669 ...
Totals.....	\$187,614,292	\$197,993,571	\$222,854,847 + 17.7

A Sheffield Manufacturer in South Africa.

Coming so soon after the Birchenough report on South Africa, it may seem as if that market is the only one of importance. This is, of course, by no means the case, but at the present time it is urgent that an accurate knowledge of trade conditions in South Africa should be obtained. The following extracts from a letter from a Sheffield manufacturer at present in South Africa are therefore to the point:

After a fine voyage to Cape Town, I began to look at the business aspect. I was fully aware that trade was bad, the labor market glutted, and the merchants and up country houses very much depressed; but the retail departments were in a fairly healthy state, and spoke hopefully for the future. The great glut of merchandise that had accumulated during the war, caused principally by a too sanguine view that peace would be declared 12 months' earlier, induced merchants and shippers to send out stuff by thousands of tons, and the railway companies not being able to deal with so much, it was dumped on the various wharves and the open ground, causing great loss. This stuff naturally had to be disposed of, in many cases at great loss. This block has gradually been removed, now that the railways are at liberty to deal with it. Still the fact remains that these enormous stocks must be sold. I was informed that further down the coast things were much worse, and in Durban it was pitiable to see the large number of unemployed, many sleeping out at nights wherever they could; and to make things worse and intensify the distress, nearly every ship was bringing out large numbers. One week in Durban over 600 came from the Australian ports, chiefly joiners and builders, induced by the reported high wages, forgetting that the building boom would soon slack off, and such an influx would pull down the rate of wages, while at the same time lodgings were going up and food was very dear.

After spending one week in Port Elizabeth and two in Durban, we moved up country to Johannesburg, staying one day in Ladysmith. We drove over the battlefields, and paid a visit to Sir George White's house. Natal may justly be described as the "Garden of South Africa." There is fruit of all kinds in profusion, but, at the same time, it was suffering, like other parts, from severe drought. In the Orange River Colony and Cape Colony sheep, goats and cattle were dying off by thousands. Fortunately, rains have just saved the agriculturists from ruin, but there is a good deal of cattle sickness, especially in Rhodesia and Matabeleland.

Johannesburg, or the misnamed "Golden City," is under a great cloud owing to the labor question. The mines cannot be worked owing to scarcity of native labor, and it is becoming manifest, even to those who opposed it most, that under proper restrictions Asiatic labor will have to be brought in. To my mind this will do more to induce the Kaffir to return than anything else. The black boy won't like to see his labor taken from him, but as it stands at present the mines are doing very little, and there is a great depression. Many large, fine buildings have been put up, but many more that were contemplated are being left in abeyance.

Another thing as affecting the trade of England, and especially of good old Sheffield, at which I felt grieved, is the absence of desire (or perhaps other reasons that I don't understand) to conform to the requirements in shape and get up of various tools. There are some rather important works in connection with the Government going on in Pretoria and Johannesburg, and one of the heads of the Department informed me that in the carpentering department there was not an English made Edge Tool, Hammer or Saw, and a great many of the Files

were American. The men would prefer English make, but they cannot get them made and fitted to suit them so well, or as easy to work with. I asked several of the Hardware merchants, and they corroborated the fact, saying, "We would much rather import English make, but the artisan won't buy them." Surely our manufacturers ought to wake up.

I left Johannesburg for Bulawayo by way of Potchefstroom, crossing to Mafeking in post cart. One hundred and thirty miles in post cart, starting 2 a. m., finishing 11 p. m., and 40 miles like going on the bed of a river, all ricks and stones, is a rare thing for a sluggish liver. Mafeking is a nice, clean, enterprising town. They have got up a lot of nice buildings, and nearly finished a new Town Hall, which will be a credit. After two days' rest I started for Bulawayo, 34 hours' journey. The first day was fearfully hot—a dust storm blowing all day. It is a fine grazing and agricultural country, plenty of timber, but short of water. We passed the Matappos Mountains. They have some fine buildings here and very wide streets, but business, in sympathy with other places, is very depressed, and, like Micawber, waiting for something to turn up.

An Aluminum Solder.

Prominence has been given in the public press during the last few days to an alleged discovery of a workable Aluminum Solder by a French chemist. It will take some time to ascertain definitely whether it is of substantial value. Those concerned with the aluminum industry from time to time hear rumors of the discovery of a suitable solder, but up to now they have not proved satisfactory. Undoubtedly the man who discovers a good solder will make his fortune, for it is the want of this accessory that seriously hinders the development of aluminum manufactures.

There are several problems to be considered, but the principal difficulty is caused by the almost instantaneous formation on the pure, or practically pure, aluminum of a thin film of what is at present assumed to be an oxide (it has not yet, I think, been analyzed), which prevents the solder adhering to the aluminum, unless certain precautions are taken, which naturally render the work of soldering costly as compared with other metals. If a process could be devised which would remove this film simultaneously with the application of the solder, then it is probable that the cheaper forms of solder could be used, with a consequent saving in the cost and a wider use of Aluminum Utensils. Various methods have been employed which may roughly be divided into three classes—combinations of these being sometimes resorted to—namely: 1, Those using a flux; 2, those employing a special solder which works its way over the surface without a flux; 3, those depending upon the mechanical abrasion or cleansing of the surface, while the solder is being applied.

In regard to the first, a successful flux is composed of potassium fluoride as the principal ingredient. Potassium fluoride and resin are dissolved in acetone, and a little zinc chloride added to harden the mixture. By exposure to the air a partial solidification takes place, the resultant substance being in a form suitable for a flux. Another material which, for certain solders, forms an admirable flux, is stearic acid. By applying this to a freshly scraped aluminum surface, and then applying a tin, lead and zinc alloy, the difficulty of soldering aluminum is considerably reduced. As to the second method, the following metals have been successfully employed, especially the first, which in a marked degree seems suitable owing, it is believed, to its closeness in the galvanic series to aluminum (galvanic action not being readily set up from the combination of the two metals afterward, which generally takes place with other combinations): Zinc, tin, aluminum, lead, nickel, copper, bismuth. A successful solder composition is something of the following: Zinc, 21 per cent.; tin, 76 per cent.; aluminum, 3 per cent. This may be applied directly to a cleaned aluminum surface without the use of a flux and at a temperature but little above that which is necessary for soldering copper or iron.

It is probable that the French discovery is in some degree a modification or combination of the methods above mentioned. There are quite a number of points to be borne in mind when dealing with this subject, as aluminum, is a peculiar metal from a metallurgical and electrolytical point of view. Those who are profession-

ally interested in the question would do well to obtain a copy of the January (1903) number of "Electro-Chemical Industry," published in Philadelphia. An article in this number gives the present position in regard to aluminum solder. A great deal of useful information can also be gleaned from Richards' book on aluminum, third edition, published in 1896.

Postal C. O. D.

The discussion as to the postal cash on delivery system now proceeding in this country, is at least successful in bringing out a number of interesting facts. The small retailer in Great Britain is strenuously opposed to the system, because it materially helps, in his opinion, the large stores and catalogue houses. The general secretary of the Ironmongers' Federated Association states that he is sending to each honorary secretary of every local association a form of typed protest against the C. O. D. system, which is to be sent direct to the Postmaster-General and to the local members of Parliament. He remarks: "Once the post office adopts the system, then the local ironmonger will have his town flooded with parcels from catalogue houses and other outsiders, and more of his ready money trade will go." With great respect, it seems to me that the local progressive ironmonger need have no fear of the C. O. D. system. If it be true that his own town is to be flooded with parcels, there is at least nothing to prevent him flooding his own town, and other towns too, with his own merchandise. It seems to me to cut both ways. It is abundantly evident, however, that the C. O. D. system hits the incompetent retailer with real severity. It undoubtedly takes away some of his cash trade and throws him deeper and deeper into the slough of the credit system.

For some time past the Postal Committee of the London Chamber of Commerce has been engaged in collecting information about the "cash on delivery" system. So far as it has gone, the inquiry seems to show that extensive use is made of the system in those countries in which it is in operation. In India, where the "value payable" system, as it is called, was introduced in 1877, the number of articles in the case of which advantage was taken of it increased from 413 in 1877 and 338,930 in 1884-85, to 1,735,998 in 1894-95 and 3,339,097 in 1902-03, their value rising from 6721 rupees in 1877 to over 4,000,000 (or 4 crore) rupees in 1902-03. In the Indian system articles may be sent of not less than 4 annas (about 8 cents) and not more than 1000 rupees (about \$324) in value.

The committee has also obtained some figures for the value payable letters and parcels in the following countries where the system is in operation: Germany, Austria, Belgium, Bosnia-Herzegovina, Denmark, France, Hungary, Italy, Luxembourg, Norway, Sweden, Holland, Portugal, Roumania, Switzerland, Egypt, Tunis and Algiers. In these 18 countries in 1901 there were dispatched to other countries 871,663 value payable letters and 2,710,598 value payable parcels, the total value of both kinds being 62,408,046 francs. It should be explained that in most of these countries two varieties of the cash on delivery system are in vogue. In one the post office collects the money due to the seller at the same time as the article sold is delivered to the purchaser; while in the other it acts simply as a debt collector, the sum collected and remitted to the creditor being the price perhaps of goods delivered weeks before. In some cases even the post offices undertake the collection of bills in the same way as a bank. The committee is now engaged in procuring information as to the extent to which the cash on delivery system is patronized for domestic or internal business in the different countries.

German Street Lamps in Edinburgh.

The Edinburgh street lighting authorities have decided to use an incandescent gas lamp manufactured in Cologne for the lighting of the streets of the city. Thirty-four makers of lamps at home and abroad were invited to compete, and after full consideration the conclusion reached is that the German lamp, while slightly cheaper than those of home manufacture, is substantial in construction, and also gives a better light than any of the others of which samples were received. It is understood that about 10,000 lamps will be required.

IOWA IMPLEMENT AND VEHICLE DEALERS' ASSOCIATION.

THE eighth annual convention of the Iowa Implement and Vehicle Dealers' Association was held at Davenport on the 1st, 2d, 3d and 4th inst., with nearly 500 persons present. The first session, held on Tuesday evening, was one of introduction and was passed in welcoming the delegates to Davenport. After roll call on Wednesday morning President O. V. Eckert delivered his annual address. Mr. Eckert expressed his pleasure at seeing so many members in attendance and his gratification at the liberal financial and other support which they had given the association. He spoke in commendation of the insurance feature of the association, and solicited the assistance of each individual member in defeating measures inimical to the interests of the dealer, particular stress being laid on the Parcels Post bill. He spoke strongly in favor of local organization.

Following the president's address, Secretary D. M. Grove presented his annual report. The report showed that the association had experienced a most profitable year, 88 members having been added to the list. At the close of the secretary's address committees were appointed on resolutions and nominations. J. D. Clarkson of Missouri, a member of the Western Retail Implement and Vehicle Dealers' Association, spoke briefly of trade in Missouri, and dwelt especially upon the advisability of fraternal relations among local dealers. Secretary Grove spoke of the unprecedented progress of the insurance feature of the association. The first policies were written on December 1 of last year, and now that department has over \$375,000 of insurance written.

At the Wednesday afternoon session the convention went into executive session for the purpose of considering the Harvester and Binder question. An address was made by J. L. Farrington and a communication on the subject read from S. W. Hill, chairman of the Harvester Committee, who was absent. E. R. Moses of Great Bend, Kan., and several others took part in the discussion which followed the addresses.

A. J. Sowers, Bedford, Iowa, vice-president of the association, opened the morning session of Thursday by an address on the subject, "Where the Dealer is to Blame." Mr. Sowers, among other faults of the dealer, referred to his carelessness at times in not handling goods of established reputation, and of substituting something new and untried for an old line of deserving worth. He also referred to the practice of price cutting and seeking to run down the business of a competitor. An address was also made by Nathaniel French, and following this a report of the delegate to the National Federation meeting.

The morning session of Friday was devoted to miscellaneous business and reports of committees. Officers were elected for the ensuing year as follows: President, E. P. Armknecht, Donnellson; vice-president, A. J. Sowers, Bedford; member of Board of Directors, J. F. Grace, Glidden. Subsequently the following committees were chosen: Legislative Committee—D. A. Lyon, W. P. Jones, A. J. Sowers, O. V. Eckert, J. J. Gaston, W. J. Hall, James H. Shepherd, J. A. Hosmer, D. A. Fesler. Committee on Bylaws—D. F. Young, T. S. Tweed, J. P. Talcott. Committee on Grievances—W. J. Howard, Theo. Coffey, James McCoy, D. M. Grove. Membership Committee—Homer E. Pitcher, J. R. Pleasants, W. C. Reuscher, J. B. Vorse, D. F. Spratt.

The W. B. Mackinson Company, Kissimmee, Fla., have been succeeded by Graves & Graves. The new firm have added furniture to the former lines, embracing Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Paints and Oils and Sporting Goods.

Walters & Henderson have consolidated with the Sanger Mercantile Company, Sanger, Texas, under the latter style. The lines carried include Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, &c.

NEW ORLEANS NOTES.

FROM A SPECIAL CORRESPONDENT.

THE upward lift in iron and steel and the ever increasing range of prosperity along general lines have prevented the usual pre-holiday lull from being felt in New Orleans Hardware circles. After a season which has surpassed all expectations, the Hardware houses of the city have kept their drummers in the country to the very verge of the holidays, while the retailers have been asserting their claim to the best holiday trade in the history of the city. The increase in the Hardware business has merely been proportional to the general trade activity of the city—evinced by the bank clearings, which have been steadily breaking records week after week since November 1, and which are now running 30 per cent. greater than they were during the same time in 1902. Thus it is seen that "prosperity talk" is justified. This prosperity is arranged in different proportions in varying classes of the business. Summarized, Farm Implements have led everything, due, of course, to the extreme high price of cotton, the abundant feedstuff crops and the tremendous increase in acreage in rice. These three points have been emphasized by the developments of December and late November. Sheet Roofing, Building Hardware and Carpenters' Tools have followed next in the country trade, but not so with the local city trade. Household Hardware has during the past month come next in the list. Ship Chandlery in New Orleans has enjoyed a boom, hoped to be permanent but feared to be temporary. Mill Supplies have suffered through the dull season with saw mills, and with the closing of the grinding season upon the sugar plantations.

In connection with Mill supplies, it is to be mentioned that the New Orleans Railway & Mill Supply Company are to be reorganized, the present firm dissolving. It is understood one of the principal stockholders will probably absorb the majority of the stock. There has also been incorporated a new Mill Supply company, with a capital stock of \$50,000. This is to be called the Whitney Supply Company, Limited. The persons comprised in the new house are at present interested in the Whitney-Sloo Saddlery Company.

Prospects in the Building and Household Hardware lines for the usual spring trade are unsettled by reason of an impending conflict between the associated building contractors of New Orleans and the building trades unions.

The ever advancing range of prosperity among the cotton planters has acted as a stimulus to Hardware and Implement demand from Mississippi and North Louisiana, and the entire cotton belt is buying heavily in all lines. Drummers from the entire region are reporting sales just now running from 25 to 30 per cent. heavier than last season, and in an exceptionally good class of articles.

The rice trade has kept good pace with that of the cotton region, and New Orleans agencies for the Northern harvesting machine firms have fought hard to capture the business for this city. Some degree of success has attended the efforts, and the traffic managers of both the Texas & Pacific and the Southern Pacific roads assert that the Dallas territory is being cut into in no inconsiderable degree. The Texas trade, as a rule, complains that New Orleans does not sufficiently advertise its goods in the Texas territory, and points to the vigorous methods adopted by St. Louis to force notice of its wares upon the Texas custom. It is pointed out that the New Orleans people do not patronize the Texas papers, while the St. Louis people do; that the New Orleans Merchants' and Manufacturers' Association does not offer the inducements to trade that are proffered by the similar institution in St. Louis. In spite of this dilatoriness, which is generally admitted, the territory commonly conceded to the Crescent City has noticeably increased.

That the Implement dealers of New Orleans are to make a determined effort to capture the Cuban and the Porto Rican markets seems just now an assured fact, and that the Hardware dealers are to join with them in this effort is equally certain. Under the leadership of the New Orleans Progressive Union there will be an excursion of New Orleans heads of business houses through

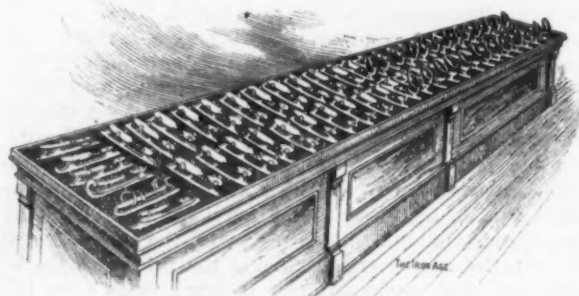
the cities of the West Indies, as included by these two islands, after January 9, 1904. The excursion will be limited to the passenger capacity of one of the Southern Pacific Morgan Line steamships, and will consist of 54 wholesale dealers and jobbers in all lines, but with the Hardware and Implement men fully represented.

The route of the excursion will be to Havana, thence through the cities of Cuba, and finally across to San Juan, in Porto Rico. Arrangements will be made in advance for meeting all the officials of the commercial bodies of the various cities, and for extending the acquaintance in social and business ways to as many as possible of the merchants of the two islands. An extensive series of pamphlets and catalogues in Spanish and in English will be distributed, and nearly all the business houses interested are to see that their own personal literature is also presented to the attention of the Spanish-American islanders. Those interested in the matter are confident that considerable good will result from the excursion, and the local business world is now more aroused over the possibilities of trade expansion through New Orleans to the West Indies and Spanish America generally than ever before. It is said by many of them that the city has been neglecting opportunities to the south too long, and that if these opportunities are not soon grasped they will be taken advantage of by other distributing centers, and the trade thus turned into foreign channels which it will be extremely hard to dislodge.

A movement has been set on foot by the most prominent business men connected with the New Orleans Board of Trade for the organization of a steamship line to be called the Mississippi Valley & Orient Steamship Company, which will be owned by the exporting and business interests of the entire Mississippi Valley. The capital stock is to be \$5,000,000, and the intention of the inaugurators of the movement is to establish a line of first-class passenger and freight transports, which shall ply between New Orleans and the west coast of South America and the Far East after the opening of the Panama Canal. It is held by the committee and the prominent men behind the movement that the ten years to elapse before the opening of the Panama Canal will not be too long for the organization of the company and the upbuilding of a fleet sufficient to grasp at once the trade which will flow from New Orleans to South America and the coast of Asia.

A SKATE COUNTER.

SKATES are shown during the winter season in the store of A. H. & E. W. Abbe, New Britain, Conn., on the top of a large and narrow counter covered with black



A Skate Counter.

cloth. They are arranged in the manner shown in the accompanying illustration. On the end near the door are placed a few fancy Skates, and beyond these are arranged double rows of Men's Skates. At the far end are placed Women's Skates. The display is attractive and should command the attention of any customer interested in this line of goods.

SANSOM & ROWLAND, Hardware merchants, 422 Commerce Street, Philadelphia, Pa., have found the building they now occupy too small for their growing requirements, and will, on January 1, 1904, remove to 511 Commerce Street, where their facilities will be greatly increased in every direction.

HIBBARD, SPENCER, BARTLETT & CO.

HIBBARD, SPENCER, BARTLETT & CO., wholesale hardware dealers, Chicago, have elected the following officers for 1904:

President, A. C. Bartlett; vice-presidents, Charles H. Conover, Wm. G. Hibbard, J. J. Charles, Frank Hibbard; secretary, A. M. Graves; treasurer, E. G. Clark; assistant secretary, C. B. Whipple; assistant treasurer, H. J. Sawe; credit manager, F. L. Macomber. A new director was elected in the person of Wm. A. Sickles. This election is in the nature of a promotion to most of the officers named. Mr. Bartlett, the president, was previously first vice-president. He succeeds the late Wm. G. Hibbard, who died October 11. Wm. G. Hibbard, the new second vice-president, is a son of the deceased president. He was formerly a director. Mr. Conover, the new first vice-president, was formerly secretary of the company, while the new secretary, assistant secretary, assistant treasurer and third and fourth vice-presidents were formerly only directors. Mr. Clark, the new secretary, had formerly the title of cashier.

THE W. M. PATTISON SUPPLY COMPANY.

THE W. M. PATTISON SUPPLY COMPANY, Cleveland, Ohio, have issued an imposing illustrated catalogue, showing the varied line of Heavy Hardware supplies for steam fitters, machinists, railways, factories, &c., which they are handling. It also represents Engines, Pumps, Boilers, &c. To the exhibition of this extensive line more than 1200 pages are devoted. The volume is of handy size, compactly arranged, and reflects credit upon the company.

Williams Mfg. Company's Baskets.

The accompanying illustrations are of a few new baskets recently placed on the market by the Williams Mfg. Company, Northampton, Mass. These baskets will



Fig. 1.—New York Oak Butcher Basket.

be illustrated and listed for the first time in their forthcoming catalogue for 1904. The basket shown in Fig. 1 is made on the same general principle as the ordinary oak market baskets made by this company. They are,



Fig. 2.—Display or Show Baskets.

however, made in a stronger manner, and have extra strapping from side to side, in addition to the regular strapping lengthwise. Bamboo, of which a large portion of the company's baskets are made, is a material specially adapted for heavy baskets and for baskets that are

subject to rough handling and hard usage. The baskets shown in Fig. 2 were originally made for grocers' use, for displaying fruit, vegetables, &c., but are now used for almost any sort of counter display, hardware dealers, it is remarked, finding them as useful as grocers. After considerable experimenting with different materials, the Williams Mfg. Company finally came to the conclusion that white German reed, or rattan, as it is commonly called, was the best material of which to make clothes baskets, hampers, &c. That this conclusion was correct has been proved, the manufacturers state, by the steady

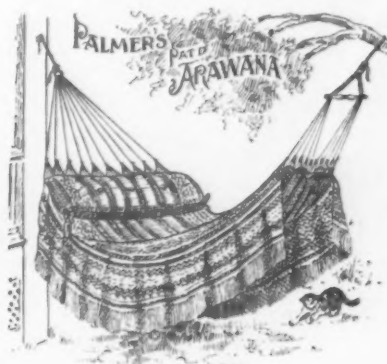


Fig. 3.—Hamper.

increase in the demand for these goods. The rattan is imported from Germany specially for them. Is then split, and with selected white ash for standards, made into the line of baskets known as Williams rattan clothes baskets, which are alluded to as especially serviceable. The same materials are also used in making laundry baskets, hampers, Fig. 3, and waste baskets. The company's 1904 catalogue, No. 55 A, will be sent by the company upon request.

Embroidered Hammocks.

The embroidered hammock, one pattern of which is shown in the accompanying cut, is manufactured by I. E. Palmer, Middletown, Conn. A special loom has been

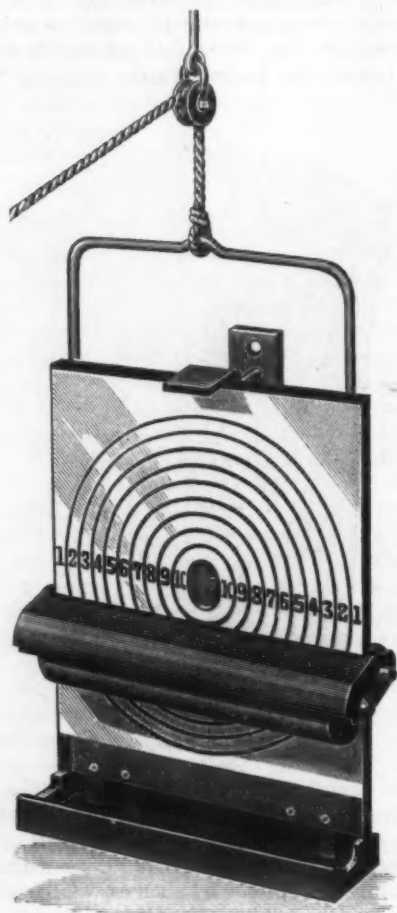


Embroidered Hammocks.

designed by means of which effects are introduced into the hammock meshing very like hand embroidery. The embroidery appears in a number of attractive designs. While the mechanical appurtenances and the general forms of the hammock will not differ materially from those of last season, the new designs, including the new embroidery effects, will give to the Palmer line a decided novelty.

Self Painting Target No. 5.

H. M. Quackenbush, Herkimer, N. Y., is putting on the market the self painting target, shown herewith. It consists of a steel plate 12 x 12 inches in size, $\frac{1}{4}$ inch thick. The roller is made of felt, the raising of which paints the face of the target; the roller then dropping, rests in a re-

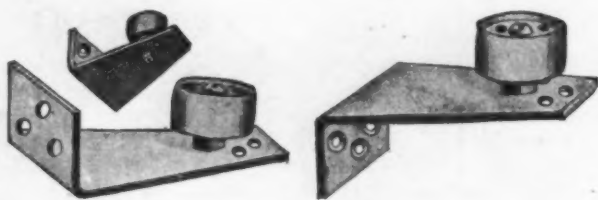


Self Painting Target No. 5.

ceptacle containing paint. The roller is well housed to protect it from injury. The bullseye is so arranged that when hit a bell rings. The target can be operated at a distance by a cord, as shown in the illustration.

The Midland Adjustable Stay Roller.

The Midland adjustable stay roller, illustrated herewith, is being put on the market by Midland Iron Works, Racine, Wis. This is designed as an all around roller, as it can be used either side up, on either inside or outside doors, and is suitable for doors which run close to

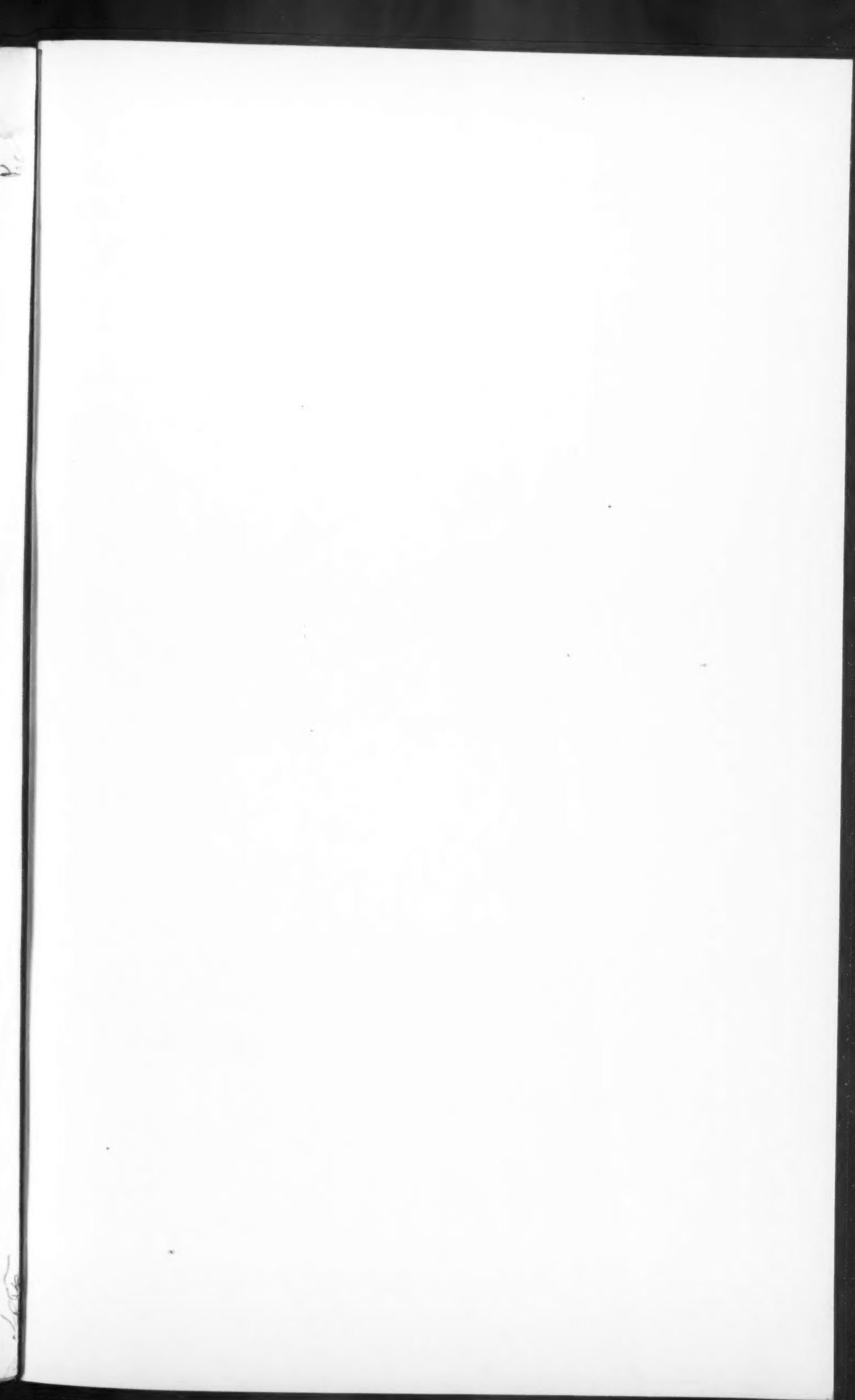


The Midland Adjustable Stay Roller.

the floor. The adjustment is by means of holes instead of by a slot or screw. This overcomes an objection that the wheel jars loose and shifts its position. The roller is fastened to the building by means of flat head screws or flat head stove bolts, and the holes for these are out of line, making a strong fastening and preventing the roller tipping sidewise or turning entirely over and freeing the door. This roller is made of sheet steel, with malleable iron wheel, and packed three dozen in a case.

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